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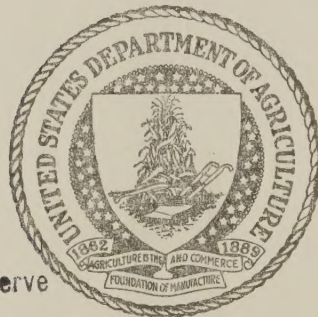
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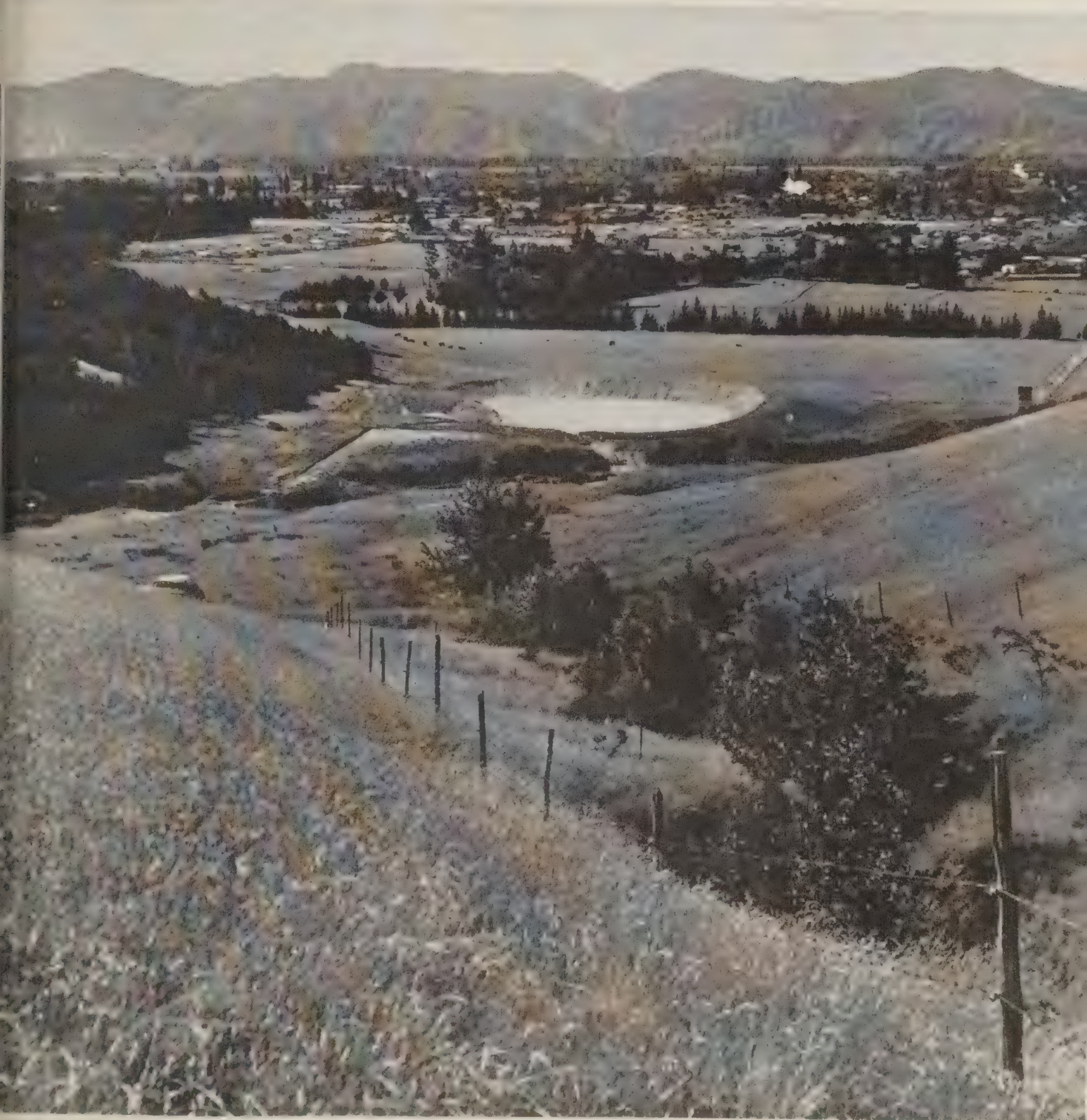
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AUGUST 1962

Soil Conservation





Growth Through Agricultural Progress

Soil Conservation 25 Years Ago

"When the Spanish conquerors ascended the lofty ranges of Peru, the Incas were practicing a highly effective system of soil and water conservation by skillfully building soil-holding walled terraces along the precipitous mountain slopes and applying to the crops grown on these contoured shelves water brought from nearby and remote places through ditches and tunnels. The soil thus held in place has been safely cultivated across the centuries. Many of the terraces that were in use when Pizarro overthrew the great southern civilization are still being farmed. And, in the Philippines, the head-hunters of the mountain ranges were similarly utilizing and conserving soil and water when the Spanish entered that part of the Orient."

"Controlling erosion on agricultural land is the major problem of the Service and is given preference in all cases."



COVER PICTURE—This completely healed gully and the pond for livestock and irrigation water are part of effective conservation work at Marlborough, South Island, New Zealand. (Soil Conservation and Rivers Control Council photo.)

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Soil Conservation

ORVILLE L. FREEMAN
Secretary of Agriculture

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Administrator, Soil Conservation Service

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Conservation Is International

By Donald A. Williams

ONE of the United States' most important agricultural exports today is soil and water conservation information and technology. It is not a commodity that shows up in our trade balances; but it is nonetheless real and substantial worldwide.

We also import a certain amount of conservation information and materials from some other countries which have moved forward in this field; but the "balance of trade" understandably is in our favor, as the Nation that has devoted more of its agricultural scientific energies to the development of soil and water conservation and has spent more money in applying conservation measures on the land than has any other. The resulting abundance of exportable conservation knowledge has been made possible by cooperative local, State, and Federal research and technical action programs, and the outlay of private funds.

Problems of soil erosion, land misuse, and water waste are not contained by national boundaries any more than they are limited by farm fence lines or by county, State, or other political boundaries. They are worldwide. Everywhere but in deserts and frozen polar regions land is subject to erosion if it is not protected by vegetation.

Meanwhile, nearly all of the world's approximately 15 billion acres of agricultural land needs some degree of protection against erosion. Controlling erosion is one of the most urgent problems facing the world's peoples in this day of rapidly growing populations and increasing pressures upon the land for production of food, fiber, and other crops to meet their needs.

Although floods, because they

are spectacular and cause costly damage easily seen and measured, properly receive much attention anywhere, soil erosion should receive certainly no less attention. It decreases soil productivity and reduces water availability for crops, human needs, industrial and other essential uses, and can have serious effects upon the development and progress of any nation.

Fortunately, land studies and surveys being made in both the larger and more important agricultural regions and in small and remote areas are showing the locations of areas needing soil and water conservation treatment. Made through national conservation programs, these surveys point up what and where the land problems are. Generally, such studies also have shown that when the people of a community, a state or province, or a country as a whole understand the extent and economic significance of their land problems, they want to undertake programs to remedy them.

A continuing reminder of the growing trend in this respect is to be found in the agriculturists who come to the United States each year to observe soil and water conservation work in areas having similar conditions to their own, and to learn as much as they can about modern conservation techniques. They also study administrative organization and procedures for putting those techniques into practice at home. Others similarly visit other countries in which conservation programs are under way, especially those countries having more closely related problems.

And there are some outstanding soil and water conservation programs of national extent that already are proving their effective-

ness in stabilizing and safeguarding the agriculture of the countries that have them. Also, a cooperative "international" movement for soil erosion control is beginning; that is, through cooperative conservation operations between neighboring countries likely to have similar problems of wind or water erosion. They, too, of course, need technicians trained in the use of conservation practices.

In all cases, the Soil Conservation Service looks upon any contributions it can make to such training, and to the furthering of conservation programs in any way its facilities permit and where opportunities for service in fact exist, as a highly important obligation.

I was made especially conscious of the importance of doing so when I spent several weeks in India, at the request of the Indian government, to make recommendations for strengthening its soil and water conservation program started in recent years. Modern India is among those countries that are trying to deal with land-use and related problems, and to establish new patterns of resource use that more nearly will meet the needs of their people. I considered it a privilege to have been asked to help the Indian government in its search for those new patterns.

Wherever it may be, whether in India or in the United States, there is unending need to be forward-looking in all works concerned with the conservation of soil and water or other natural resources. It is encouraging, heartening, to know that this attitude, increasingly supported by action programs, is spreading at an ever-faster rate around the world.

Soil Conservation Around the World

By Phoebe Harrison

IT probably is safe to say that practices to protect the soil's productivity are being sought by some of the people in all countries today and that they are being used to advantage in varying degrees in the great majority of countries.

The largest areas being treated for soil and water conservation each year include United States farm and ranch land. Then come the agricultural states of Australia, New Zealand, the Rhodesian Federation, and the Republic of South Africa, all of which have firmly established programs, and Mexico and large areas in nearly every Central and South American country.

Much progress is being made in countries bordering the Mediterranean, especially in Spain, Italy, Greece, Israel and Jordan, Turkey, and Libya and Algeria merging into the Sahara.

The first recorded formal soil conservation programs outside of the United States were initiated in 1936 in the three prairie provinces of Canada—Saskatchewan, Alberta, and Manitoba—and in Kenya, East Africa. They and countries that have undertaken programs in the ensuing years have drawn liberally upon research, educational, and technical information from the United States. Many have received help from Soil Conservation Service technicians detailed to them through "Point Four" and other technical assistance programs, or have sent their own agriculturists to this country to study our conservation methods and administrative procedures.

Soil conservation district programs are in operation today in no fewer than 20 other countries; and

requests continue to be received for district model legislation and regulations from countries planning to broaden their conservation programs. They are patterned after those which have been operated so effectively by farmers and ranchers in the United States since 1937. In most countries, however, the conservation programs first have had to go through the initial educational and demonstration-project stage similar to that which preceded our own extensive districts program.

The Philippine Republic is a leader in soil conservation among Pacific region nations; and so is Malagasy, the newly made republic occupying the island long called Madagascar. Its program provides an interesting example of how the idea of soil conservation can be retained in transformation of a country from colonial status to a republic.

The U.S.S.R. incorporates some



Runoff control structures in Andes region of Venezuela.

soil and water conservation practices in connection with state and collective farm programs, and also in reclamation projects and programs for development of wild or new lands. In north central continental China, a vast plan for river management, combined with irrigation and use of soil conservation on land between the streams is under way.

Modern soil conservation prac



Contour farming in Clifton district of Queensland's Darling Downs.

Note:—The author is information specialist, Soil Conservation Service, Washington, D. C.

tices are beginning to take hold in several European countries above the Mediterranean tier. Yugoslavia has an active program; and some significant soil and water conservation research is being done in Poland.

Good land use, and some erosion-control methods long have, from



Typical farmer meeting held by Soil Conservation Division near São Paulo, Brazil.

necessity, been used to maintain the agricultural base of these middle countries of Europe. Modernization of erosion-control practices is helping to raise productivity on a sustained basis in several regions.

Among Asian countries, India

and Pakistan, and Nationalist China on the Island of Taiwan, have established soil and water conservation programs that have the authority and backing of their governments.

Greater yields from the acre, hectare, morgen, donum, or whatever unit is used for measuring land, undoubtedly is the main incentive that keeps soil conservation spreading and makes programs to improve the land "stick," sometimes under great difficulties. New Zealand reported a 90 percent increase in grassland-carrying capacity for cattle by means of soil conservation, and a 75 percent increase for sheep. Doubled and tripled yields of food and pasture crops are reported by the departments of soil conservation of Mexico, Venezuela, Colombia, and Sao Paulo State in southern Brazil, the Republic of South Africa, Rhodesia, and three Australian states. Yield increases already are apparent in Spain, with one of the world's newest programs.

Another significant feature of today's interest in conservation around the world is an increase in surveys that are being made in many countries to determine their conservation needs. Some remark-

ably painstaking land studies and surveys have been completed in recent years, including the United States' own National Conservation Needs Inventory, to show the exact locations of areas needing different soil and water conservation treatments and projects. This important conservation activity is happening not only in some of the world's largest and most important agricultural regions but also in small and remote areas where no such surveys were ever made before.

Surveys of this kind are being given special attention in New Zealand, Australia, the Philippines, Canada, Mexico, South Africa and the Rhodesia-Nyassaland Federation, and in Spain, Portugal's overseas colonies, France, and Israel. They show in great detail where conservation projects should be concentrated. They are made through national soil conservation programs and with national funds. They fill a need of long standing, and are expected to point the way toward economical and efficient handling of land problems in the future.

SCS MEN LEARN FRENCH

Two Vermont Soil Conservation Service technicians took a course in conversational French in order to be able to discuss farm planning with the growing number of French farmers in Orlean County in their own language. Roger Beadle, work unit conservationist, Newport, Vt., who took the course with Herbert Dunbar, conservation aid, Barton, under Prof. Jean Goulet of Sherbrooke University of Sherbrooke, Quebec, spoke for both when he said: "I think I now could go out with any French farmer and gather enough information to develop his conservation plan or work with him in any phase of planning or application."



Vineyard plantation on contour in Israel's Jeze'el Valley.

Keys Key Conservation

By R. W. Sanders

To Worldwide Peace Hope

THE C. P. Keys of South Carolina would have the people of the United States look to India for a lesson in frugality in handling their land and other basic resources.

Not only did the Keys, of Lodge, spend 6 weeks in India in 1961, but they afterward had Hanu Hanumanthappa of Bangalore, India, spend 3 weeks with them. He came to the United States for a year to go to school at the University of Tennessee. He was one of three visitors from other countries in the Key home in recent years. The others were from Germany and Finland. But India clearly is Key's first interest abroad conservationwise.

"In India," he pointed out, "they put every single thing to use. Even thorny bushes are used to weave fences. They don't cut trees down, they dig them up. One reason for this is they want the stump out of the way. But another reason is that they want the roots for fuel. The twigs and limbs are also used for fuel or for making plow stocks. They waste nothing."

Indian Visitor Hanumanthappa said:



Building narrow-based contour bund by hand labor in India.

"If we could double our agricultural production, we would not have a surplus. Our population is increasing at the rate of 2 percent a year. Then, too, India is being flooded with people who are fleeing bordering countries."

Speaking from his wide experience, Key noted that there is only .8 of an acre of cropland per person in India. We have nearly 3 acres per person in the United States. India has a longer growing season, however, and can grow four crops of rice or vegetables a year, because of the 12-month growing season.

"We can't change our growing season," Key said. "Then, too, population is increasing here. After seeing those things that I have seen in other countries, I have given more thought to the things we have in our own country. We are inclined to take fertile soil and other blessings for granted. Even though our population is increasing, we give utter disregard to putting good agricultural land to other uses such as housing developments, super highways, and industrial sites."

Key believes some way must be found to make our own people appreciate the natural resources we take for granted, lest our children or grandchildren experience scarcity.

"Of course, we have a surplus problem now in respect to some commodities, but farm production can't be turned on and off like a faucet," he said. "I have complained about surpluses, but I won't ever do that again. We need to take a longtime point of

view. There is no more land to be purchased for 3 cents an acre as was done in the case of the Louisiana Territory in 1803."

"And," as Key sees it, "we have just scratched the surface in realizing the potential of drainage, watershed protection and flood prevention, irrigation, and other agricultural water management."

"The two things most essential for world peace are food and education," Key believes. "From these would come improvement in standard of living and general welfare. These are more conducive to peace than are hunger, poverty, and ignorance."

Key believes modern soil, water, woodland, and wildlife conservation methods as practiced in this country could vastly help other nations. This view is based upon experience on his own farm, as a supervisor of the Colleton Soil Conservation District, and upon the observations he made in India.

He believes that agricultural production could be doubled in India if soil surveys were available, and conservation practices



Hanus Hanumanthappa of Bangalore, India, (right) listens as SCS Technician Robert W. Sanders discusses conservation plan with the Keys (left.)

Note:—The author is work unit conservationist, Soil Conservation Service, Walterboro, S. C.

were planned and applied in keeping with the capability of the land. Also, he thinks technical help similar to that provided by Soil Conservation Service technicians is needed.

This is Key's formula: Natural resources, plus culture, divided by population, equals standard of living. He points out that the plight of some nations is that they have more people than land. In

some cases culture is an important factor. He thinks that conservation and wise use of natural resources and better education of people throughout the world can be instruments of world peace.

Training For Conservation IN MANY LANDS

By J. B. Rogers and Lee B. Shields

SOIL and water conservation problems reach around the world—and so do cooperative activities of the Soil Conservation Service for helping solve those problems in other lands.

In line with the Department of Agriculture's goal of world agricultural cooperation, the facilities of the Soil Conservation Service are at the disposal of other nations for help in setting up programs to help them conserve their own soil and water resources.

The Service regularly participates in training programs in this country for persons concerned with other countries' agricultural activities. During 1961, for example, the Service assisted other cooperating agencies in developing training programs for 313 individuals from 49 countries. These trainees spent approximately 6,389 man-days, or an average of about 20 working days each, with SCS technicians around the country studying all phases of our soil and water conservation program. Included among this number were 9 Agency for International Development employees on home leave to receive "Refresher Training." Also included were 15 teams of from 5 to 20 individuals. Of the 49 coun-

tries represented, India and Turkey had the most trainees, 13 each, followed by Thailand, with 11.

Although it is impracticable to find locations in the United States where climate, rainfall, topography, and agronomic conditions coincide exactly with those of his home country, the Service tries to locate each trainee where practices are carried out that easily may be adapted to conditions at home. The SCS also assists in developing programs for those who desire training in some specific phase of soil conservation—by assignment to our cartographic units, engineering and watershed planning units, training centers, nurseries, and other field offices.

The trainees return home with a better understanding of the work being done in the United States to preserve and enhance our soil and water resources, and with the technical knowledge needed to adapt that work to conditions in their own countries. The Service has received many reports from visitors and from its own personnel, indicating successful accomplishment of these assignments. These excerpts from a few of them tell the story:

A Brazilian trainee wrote of the training of 8 district teams to map and plan farms, and to design



Trainees study soils problem on farm near Fort Robinson (Nebr.) Training Center (l. to r.): Ali Kucukkoca, Turkey; Fakhir Jabber, Iraq; Halil Isik, Turkey; Sampoo Chantaramanee, Thailand; Oentoeng Atmosoe-parto, Indonesia (kneeling).

needed conservation features. In carrying out this training, these teams gave actual assistance to nearly 100 farmers.

An Israeli trainee: "Our method of survey and planning has now been adapted entirely to your standards. Above all, we are now carrying out actual reclamation and conservation schemes on a fairly wide scale, instead of spending much of our limited time on consultations, as we used to do before. Since I have returned we have reclaimed approximately 2,500 acres of badly eroded land,..."

From two Sudanese participants: "We feel we have obtained a firm grip on some of the practical work of soil conservation... We say goodbye—but our hearts will never say so."

An Indian trainee wrote:

"India's most critical problem probably is the conservation of rainfall, which is highly erratic

Note:—The authors are foreign service officer and Information Division staff member, respectively, both of the Soil Conservation Service, Washington, D. C.

throughout the country, and brings on famine conditions 2 years out of 5. During famine periods, the government must not only provide work for farmers, but must face the problem of food. That is why every piece of information I can gather here to alleviate the situation is so important for my country's welfare."

Thirty-nine SCS technicians are on assignment with AID in 22 foreign countries, training foreign "counterparts" in adapting conservation practices and "know-how" used in the United States to conditions in their own countries. Among them are soils advisers, food and agricultural officers, agricultural engineering advisers, soil conservationists, irrigation engineers, ground-water geology advisers, management specialists, information specialists, land-classification experts, soil scientists, range specialists, and agronomists.

When a need is established for conservation help on a specific practice or group of practices, the AID sends a man in this country

who is in that particular field. He looks over the situation, determines what is needed and how best to install it, how to use the labor force available, and how to adapt his knowledge to conditions in the country. He then, with his counterpart, someone assigned by that country to learn how to adapt the practice, begins to apply the practice and trains his counterpart in adapting the practice to local conditions. Thus, when the American leaves, the counterpart is able to carry on and install the practice wherever it is needed without technical advice.

One good example of such help is that provided by Ralph S. Murphy, a former SCS technician in Texas, who spent the past 3 years as soils adviser at the AID mission in Korea. Murphy and other American technicians trained Koreans to analyze and classify soils. The first half of the training was conducted in the classroom, and the remaining time was spent in the field. Trainees learned to identify soil by its texture, and

then to make a profile. The trained Koreans were sent, one to each province, to classify the soils as cropland, orchard land, or grass and forest land. Then the soil was analyzed and classified according to composition.

Murphy worked with the men in the field as much as possible, and, from the survey data, he was able to show Korean farmers how to make the best possible use of their land. In Korea, where highly productive land is scarce, the surveys showed that tracts considered useful only for forest land were as rich as those that were yielding crops in adjoining fields. After removing the trees and using fertilizers, this land was planted to productive apples, pears, persimmons, or other fruit.

Sandy loam soils which were producing poor crops were found useful for growing peanuts, melons, and sweet potatoes. Some land that had been producing poor crops or rice was found to be suitable for growing potatoes.

Nearly every country now has some kind of conservation program going. It not always is under that name—sometimes simply irrigation, drainage, or whatever the major problem is in that particular country. But the people are doing the work themselves, which is the important thing.

The Service, for example, is providing direct technical aid to Tunisia in development of a soil and water management program under auspices of AID. The project involves watershed planning and development in a pilot area of 100,000 hectares, (approximately 44,500 acres) where all applicable soil, water, and plant conservation and range management techniques can be applied in a planned sequence, where Tunisian technicians can be trained in conservation, and where a stable economy can be developed for the local population. The results will be applicable to some 5 million hectares of arid rangeland in Tunisia.



Food and Agriculture Organization visitors from 19 countries were in group touring Bornitz Creek watershed in Dewey County SCD near Clinton, Okla.: Argentina, Brazil, Burma, Chile, El Salvador, Honduras, India, Ceylon, Israel, Jamaica, Greece, Madagascar, New Zealand, Philippine Republic, Sudan, Pakistan, Thailand, Turkey, and Venezuela.

Yugoslavians Take Home Their Conservation Findings

By Sellers G. Archer

MODERN soil and water conservation principles and techniques are being advanced in Yugoslavia through the efforts of two visitors and observers of this work in the United States.

One is Mrs. Stevanija Sanovic of Titograd, Montenegro, one of the delegates to the World Congress of Foresters in Seattle in 1960. She wanted to become a school teacher, but when she enrolled in college, the only openings were in medicine and forestry. She didn't want to be a doctor; so she became a forester!

Her compatriot is Srboljub Dobrivojevic of Zvornik, director of the Yugoslavian agency, the Section for Torrent Control and Soil Preservation from Erosion, which is the equivalent of our Soil Conservation Service. He, with Mrs. Sanovic, spent 3 months studying soil conservation and forestry practices in the United States.

The Hotophia Creek watershed project at Batesville was one of the projects they studied during a 4-week tour of Mississippi conservation projects. They saw how trees, grass, and de-silting basins had controlled erosion on steep uplands. They studied more than 15,000 acres that had produced cotton until gullyng and sheet erosion robbed the soil of its fertility, and now is planted to pine trees and pasture grasses. They saw how eroding roadsides, which once added to the large load of silt washed onto bottom lands and into stream channels, are being protected under the watershed program with grass and kudzu.

Dobrivojevic, the conservationist, said Yugoslavia has similar erosion problems and that similar

conservation treatments are needed.

Flood prevention reservoirs being built above the fertile bottom lands in the valleys were new to the visitors. Soil Conservation Service men explained to the Yugoslavians that dams on the principal tributaries of the Hotophia watershed retain normal reservoirs of water that may be used by landowners for irrigation or other purposes. They were intrigued with the design providing for flood pools, kept empty until floods come, with floodwater that builds up behind the dams then released slowly enough that the steam channels below will not overflow.

Visiting Conservationist Dobrivojevic was enthusiastic about the American program which treats "torrent control," or flood prevention, and soil erosion control as one basic watershed program.

As the Yugoslavians visited the many works of improvement being established on the watershed, they talked variously of the friendliness of the American people, of their country, and of American economic aid.

Mrs. Sanovic said the newspapers in her country carry complete reports of all aid given by the United States. All the people know that the United States is their friend, she emphasized; and she declared her intention of carrying a good report of America, the American people—and soil and water conservation—back to her countrymen.

Note:—The author is field information specialist, Soil Conservation Service, Spartanburg, S. C.



Mrs. Sanovic and Dobrivojevic being shown kudzu roadbank planting by Soil Conservationist W. D. Gordon.



Here they inspect area on which erosion is controlled with pine trees and African lovegrass.

◆
People in the United States spend about 20 percent of their disposable incomes for food, Japanese about 42 percent, West Germans 45 percent, and Russians 56 percent.

◆
The U. S. is the largest exporter of farm products in the world. These exports totaled a record \$5,030,000,000 in 1961.

Education and Skills Key To World Resources—Food Development

By Gladwin Young

THE greatest difference between food scarcity and abundance over the world lies in the state of development of minds and skills rather than in differences in the potential productivity of land. This conclusion was confirmed on a tour in 8 countries of Southern Asia in October 1961 by Secretary of Agriculture Orville L. Freeman and 12 U.S. Department of Agriculture administrative and technical staff members to evaluate progress in agricultural development and the United States' assistance program in that part of the world.

The author's assignment was to observe progress in soil and water resource development in these developing nations—Iran, Pakistan (both East and West), India, Burma, Thailand, Indonesia, the

Philippines, and Japan. It was impossible to do more than gain general impressions in the 2- or 3-day visit to each country. But by the end of 30 days and visits to 8 countries, no one could possibly overlook the fact that the pursuit of "daily bread" still occupies the energies of more people in the world than all other pursuits of man combined.

In Iran, Indonesia, and Pakistan, with a combined population of 203 million, 80 percent of the people live on the land. In India, with 438 million people, 72 percent live on the land. Even with all this human energy directed toward agriculture, there is not enough food for present populations, and certainly the outlook for matching increased food production against the present 2½ percent

annual rate of population increase is far from encouraging.

In contrast, less than 9 percent of the population of the United States is on farms; yet it feeds abundantly the rest of our 187 million people. But it was not always thus even in America.

When white men first came to this continent, there were fewer than a million American Indians; but, with a whole continent of virgin fertility at their disposal, they still were poorly fed, clothed, and housed. Now, our growing millions live with abundance from the same soil and water resources. The difference lies in what educated minds and scientific skills were able to do with available resources in contrast to what had been achieved with uneducated minds and primitive skills.

Primitive customs and traditions in existence for centuries still exist in underdeveloped countries. Any change, however promising to informed minds, is beyond reasonable risk for minds that comprehend only primitive skills and arts.

In brilliant contrast to the underdeveloped countries of South Asia, Japan is a thriving, well-developed nation. The ability of this country, not only to feed itself abundantly but also to provide itself with a high standard of living, is one of the greatest human success stories in the world.

What has made the difference? Is it land resources? Obviously not, because Japan has less than 1/7 acre of arable land per capita in contrast to .84 in India, .65 in



Land leveling is important for dryland water management and erosion control as well as in rice paddies in India.

Note:—The author is deputy administrator, Soil Conservation Service, Washington, D.C.

Pakistan, and $\frac{1}{2}$ acre in Indonesia.

Could education make the difference? Japan has less than 1 percent illiteracy, compared to more than 80 percent illiteracy in India and Pakistan and 41 percent in Indonesia—even higher among farm people. Japan started universal public schools almost 200 years ago. Many of the underdeveloped countries are just now making a start.

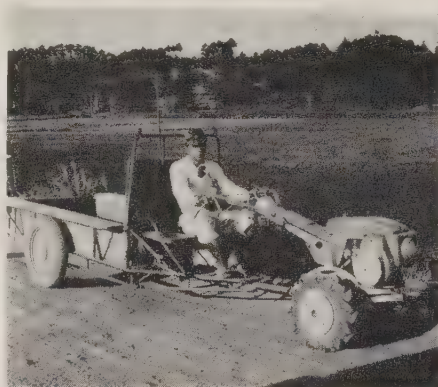
No nation can expect to progress beyond bare subsistence with illiterate and unskilled people on the land. A veneer of a few highly educated people superimposed on illiterate masses cannot develop a nation. In Iran, we visited a new agricultural college with an enrollment of 500 students. Not one of these students was a farmer's son. In the farm villages, there was no school system that would in time fill that college with bright minds with a zeal for problem solving of the kind that would be meaningful to their own village people.

Lack of education has not been the only limiting factor to development of land and water resources in underdeveloped countries. Other factors pointed out to us by experienced persons included need for land reforms, farm credit, transportation, cooperatives, and markets, plus the fact that throughout history farmers have occupied a low position in the social and economic structure.

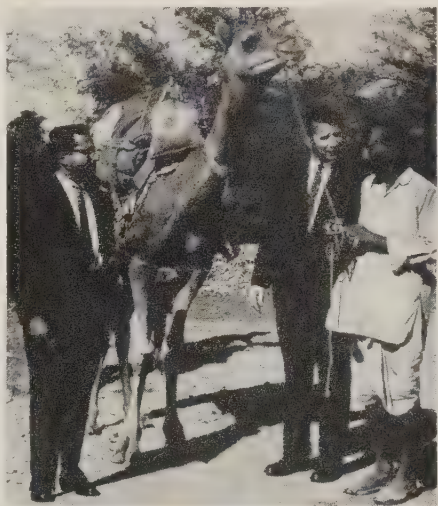
Take one 35-year-old rice farmer in Thailand, to illustrate: He produces one crop of rice from 1 hectare, or less than $2\frac{1}{2}$ acres. For 5 months he has nothing else to do. He has never been to school; neither has his wife nor their five sons. He had never used fertilizer, though he had seen it used on a demonstration farm. He said it increased yields about 50 percent but that he couldn't afford to borrow money to use it. There was no agricultural credit available and no regulation on lenders or interest rates. He was already in

debt and was paying 80 percent interest, with little chance of ever becoming debt free.

It is in this kind of deficient institutional and governmental setting that many of the technical experts from the United States



Small tractors and adapted farm equipment are replacing water buffalo and stick plow in Japan.



Secretary Freeman chats with camel driver near Agra, India through interpreter at the left.

are trying to help these and other nations increase their food production. In spite of these handicaps, many of these specialists are giving real and fundamental help to speed up the rate of agricultural improvements.

In each of the eight countries visited we found men on leave from the Soil Conservation Service and former SCS employees all making outstanding contributions, at great personal sacrifices. Their

service is not as glamorous as that of astronauts who orbit the earth, but may in fact be more significant in our search for world peace. As Secretary Freeman said in Bangkok.

"Without in any way detracting from the importance of outer space, I should like to point out that to hundreds of millions of people on earth, rice and bread on the table are more important than a satellite in the sky."

It seems obvious that increased production to feed the world's expanding population in the foreseeable future must come, and can come, from developing the soil and water resources already in use by hundreds of millions of cultivators. There is enough known technology in the world to meet these food demands. The problem is to change from existing primitive methods to the application of these known technologies. The knowledge and skills that have made American agriculture so productive and efficient are already at work around the world.

Worldwide Conservation Readers

A significant reflection of the worldwide interest in the pioneering American brand of soil and water conservation is the growing readership of such literature as SOIL CONSERVATION magazine among agricultural and other people abroad. Sixty-nine countries now are represented on the subscription list.

India leads, followed by Canada, South Africa, Japan, Australia, and the U.S.S.R.

Meanwhile, the Washington office of the Soil Conservation Service has become one of the principal locations in the world for the collection and preservation of conservation literature from different countries. After use or screening by the Service, all the publications that merit keeping, are retained by the U.S. Department of Agriculture Library.

Spain's Conservation Pro

By F

SINCE 1955 Spain has been on the warpath against erosion. Six months after the law creating the Soil Conservation Service was enacted plans were drawn up involving conservation measures on 250,000 acres. Within 2 years, 25 percent of the projects were carried out; and, at the end of 1961, 375,000 acres had been put under conservation treatment. At present there are conservation projects on a million acres comprising different soils in 16 of Spain's eroded provinces.

Although Spain is carrying on a tremendous conservation drive, hardly anyone is aware of it. Conservation, as almost anywhere else in the world, is a confusing term with which few are familiar. In Spanish-speaking countries it is often mistaken with "canning" ("industria de conservas"), with which it has very indirect relationships to be sure; but, call it as one may, the truth is that conservation is on the go in Spain.

It is fast converting conservation-conscious farmers, because improvement on isolated "pilot" farms are so obvious that many farmers are beginning to take notice and are getting ready to follow the example.

Spain has a total farming area of 83,000,000 acres, 95 percent of which are dry lands. Agricultural engineers specializing in conservation consider that out of this total, 16 percent of the soils are practically unaffected by erosion, 44 percent moderately; 29 percent have advanced erosion and 11 percent severe erosion. In the latter estimate, .6 percent are in swamps or marshlands suitable for wildlife.

A week after the late Hon.

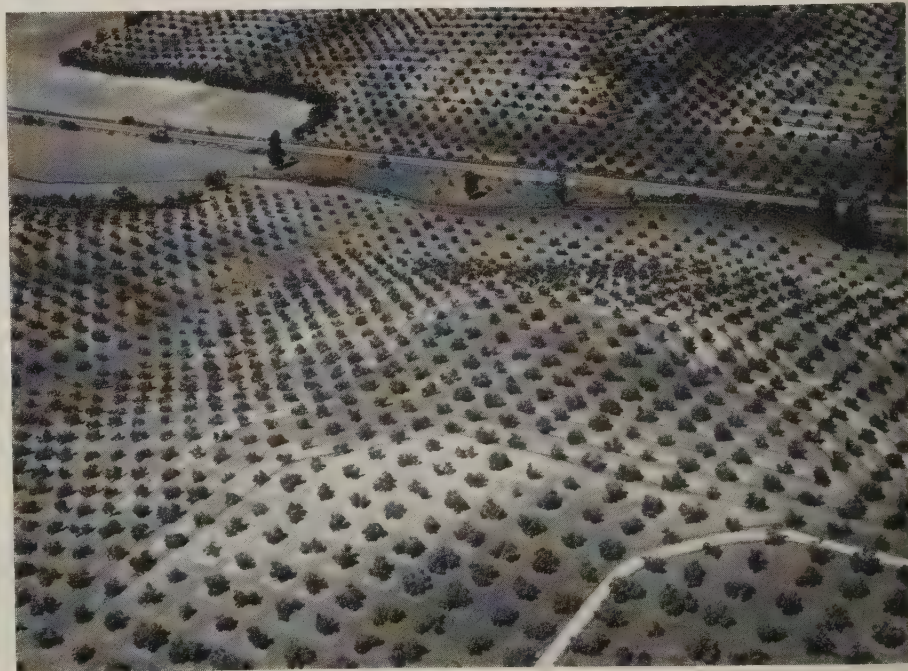
Rafael Cavestany, the Spanish Hugh Bennett, made his memorable speech at the Cortes on July 14, 1955, when he was Minister of Agriculture, and made his plea for conservation, the law was unanimously passed. Spain had officially signed its oath to save the soil and decided to survive.

Spain's Soil Conservation Service publishes very easy-to-understand manuals explaining the different soil conservation methods that enable farmers to carry them out without having to resort to the Service. In case of more complicated conditions, a farmer or a group of neighboring farmers may apply for technical assistance through official regional or syndical organizations to the Service, which is under the Dirección de Agrícola, the top technical division within that Ministry in Madrid. Department 9, "Improvement of Agricultural Lands," has

actual technical charge of all projects. A crew of technicians belonging to cooperating departments are mainly responsible for the conservation work.

The founding law declares that conservation works on farms are considered of public utility and national interest. Hence they must be cared for. In case of submarginal lands or of operations involving large expenditures that benefit other farms besides the one in which improvements are made, the Ministry of Agriculture will bear the costs either partially or entirely.

This fundamental soil conservation law was later supplemented with other legislative measures coordinating conservation works with forestation and reforestation projects on mountain slopes, watersheds and riversides, or with homesteading, dam protection to stop silting, defense against floods, etc.



Terraces on contour in olive plantation, Itanilloz, Granada Province, Spain.

Note:—The author is Chilean conservation writer.

am Makes Rapid Strides

alde

As a general rule the most popular conservation measure is contour farming, due to Spain's many mountain chains and rugged territory. One of the main purposes of Spanish soil conservation is to lessen runoff damages caused by torrential blitz rains in central, south, and east Spain which wash away valuable minerals from the soil as well as topsoil.

The worst erosion in Spain is found in the Andalucian Provinces of Granada and Almería. There are regions there in which about 75 tons of soil an acre are lost a year.

At the same time there is much concern over the silting of Spain's costly dams. Extensive forestation works are being carried out in several sites, particularly at the Cubillas Dam in Almería. The Badajoz Plan undoubtedly is the greatest public works achievement in Spain. It consists of the regu-

lation of the Guadiana River in the Province of Badajoz by a series of dams and many miles of canals and waterways. In short, it is Spain's own TVA, which has given preferential attention to good plant cover as the best possible guarantee for preservation.

The Soil Conservation Service publicizes the value of conservation through a small illustrated sheet entitled "Plaza Mayor," which features outstanding conservation success in Spanish farms. One issue features the "Pinedo" farm near the city of Toledo and the Tajo River. Each soil there has been put to its best use, either for wheat crops, olive groves, and woodlot improvements. To insure better results suitable terraces and roads were built. All these measures were carried out in 6 months at a cost of \$4 an acre. It has been reported that since the farm was "conserved" in 1958, yields have

increased by 100 percent.

From an economical viewpoint, the low cost of Spanish labor is a real incentive for widespread conservation. On 12 to 25 percent slopes, the cost per acre varies between 69¢ and 90¢, and paying up loans for conservation is made very easy. However, there are some drawbacks. For example, the use of machinery in Spain is far more difficult than in the United States, because of its very extensive rugged slopes which, due to Spain's limited available farming area, have to be plowed up. But even so there is a general trend for more ample machine use on farms needing them for conservation work.

Conservation education is a field which hardly has been touched upon. However, there is a very favorable disposition, both in educational and technical circles, towards it.

Population pressure in Spain, as in most countries, urges adoption of conservation measures. Only a small minority of farmers—those who own particularly good lands and can derive bigger profits if they care to practice conservation at a small cost—directly benefit with such measures. In general, benefits are indirect; because, for economic reasons, mounting costs call for expensive projects which can only be carried to effect at Government expense or aid. The implication is that conservation tends more and more to benefit a community rather than the individual. Conservation in Spain is thus practiced on a global scale, with massive forestation and reforestation on slopes and watersheds, with river course regulation, reclamation, irrigation and drainage projects, homesteading for



Conservation works on Almanzora watershed in Almería Province.

farming settlers on previously conserved land, integration of tiny farms to make of them marginal and economically operative units, etc. In short, conservation is the result of a many-sided national economic policy whose main goal

is to insure survival to Spain's 31,000,000 people.

Although there is always room for improvement, officials like Minister of Agriculture Señor Cirilo Cánovas and his colleagues in other Ministries are successfully

carrying out Cavestany's precepts to an extent that he wouldn't have dreamed of. Conservation in Spain not only means restoration but also survival, and worthwhile survival at that, because hopes are shining bright.

Soil Surveys Basic Throughout The World

By Charles E. Kellogg



Author (left) studying soil survey program in India.

SOIL scientists are travelers. Soils are out-of-doors and men must go to them. True, they make measurements of properties of soil samples indoors, even perform critical experiments with them, but these are only samples of parts of soils.

One can no more take a living soil into the laboratory than he can a river, a volcano, or a forest. A soil is a 3-dimensional piece of landscape with area and depth. It results from the combined actions of climate, vegetation, and animals acting on parent material, as conditioned by relief, over periods of time. Compounds are being added; others are being removed. Plants and animals are continually sorting the materials and concentrat-

ing some of them at the surface.

Soils formed by the same combinations of natural factors are alike. Changes in climate, volcanic eruptions or other natural catastrophies, and man's use of soil may improve it or may injure it for future use. Because of the intimate relationships between soils and their unique environments, the different kinds are not distributed promiscuously over the face of the world. And no one place has the same natural environment continuously. One finds relics of the desert under the high trees of the rainy Tropics and relics of the Tropics under ice and snow.

A soil scientist working in a desert wants to know all he can about soils in other deserts. He wants to visit with the soil scientists working in the other deserts. And the same is true of a soil scientist working in any other environment. Because environments change, he needs to see as many typical examples of the great soil groups as possible. For example, studies in the Arctic and in the Tropics have helped us understand our soils of the South and the Midwest here in the United States.

No one can study everywhere in

the world, and soil scientists must communicate freely among themselves. All the soil scientists of the world make a small group; yet each is likely to have professional associates and even close friends in several countries.

American soil scientists have taken part in these scientific exchanges since before 1900. For a long time, we received more than we gave; because many kinds of soil in the United States had been studied by scientists and used by farmers in other countries. Then, as our own experience grew, we developed concepts, skills, and methods in both basic and applied soil science that were of use elsewhere in the world.

Soil names like "Chernozem" and "Terra Rosa" suggest the international flavor of soil science. In this country, we now are well along toward a new system of soil classification that can include the results of research since before World War I. In this effort, we have exchanged visits, data, and correspondence with our colleagues overseas. In the process, all of us have learned a great deal about the soils of the world.

We in the United States have helped other countries get soil re-

Note:—The author is assistant administrator for soil survey, Soil Conservation Service, Washington, D. C.

search and soils surveys under way. In view of the fact that each country has its own unique set of problems, opportunities, and institutions, we have not put forward a "model." If each country had its most nearly ideal organization for soil surveys, related soil research, and soil interpretations and planning, no two of them would be alike. Success in soil surveying anywhere depends upon scientific direction, a staff of soil surveyors well grounded in the basic principles, facilities for applying those principles to clearly defined objectives, and a broad base of cooperation with other agricultural scientists.

The results are urgently needed in the newly developing countries, especially. Except for China, and possibly a few small countries in the semiarid regions, the soil and water resources of the undeveloped countries would be ample if they were reasonably well used. But the pattern of soils is complex. In the United States alone, we have more than 70,000 unique kinds of

soil, with equally unique potentials for use. The total number for the world obviously is much larger. The greatest variety is in the Tropics; and most of the soils in the newly developing countries are tropical or subtropical.

Nearly all tropical soils require large amounts of fertilizer, in order for them to be productive for commercial food and fiber crops. But, equally important, are methods for water control, kinds and varieties of crops with the genetic potential to respond, and good schemes for plant protection. Soil scientists need to find out what combinations of practices give economic returns on each kind of soil to be developed into arable land.

Agriculture must emphasize the present skills of the people and contribute to the accumulation of capital for later stages in economic growth. The role of the soil scientist, in cooperation with others, includes two main initial activities.

First: A schematic map of the soil resources of a country is



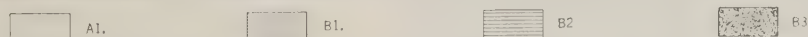
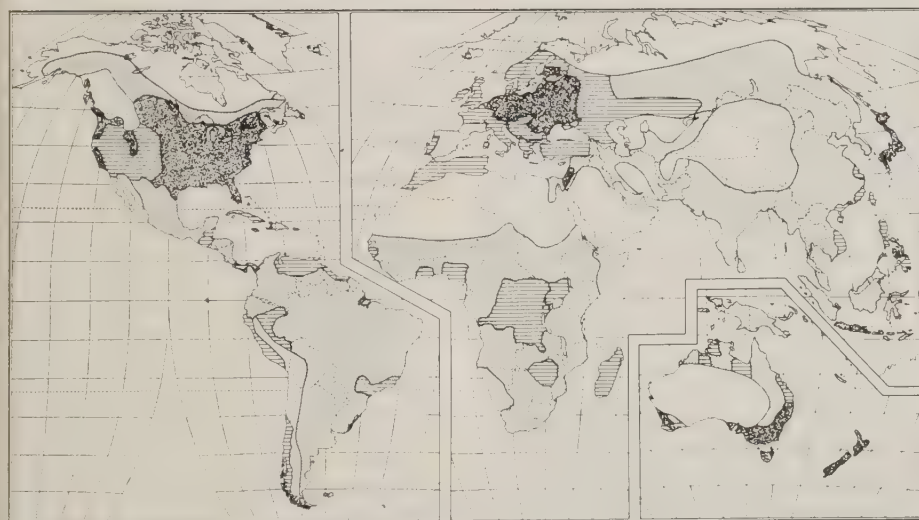
Phosphate-deficient soil in Ghana gives good response to phosphorous.

needed. The first step toward it can be made in advance from study of the available data on soils and existing maps of climate, vegetation, geology, topography, and landforms. Air photos are useful for plotting tentative boundaries. In the field, the soil scientist describes and names the soils on this schematic map. He perfects the tentative boundaries among them. The final results, which can be had fairly soon, serve as a basis for general planning.

Second: For operational planning, detailed soil maps—at about 1:20,000—are needed of the areas selected for new development or for modernization. The maps must be detailed enough to indicate the potential of each potential field.

Two closely related activities go along with the soil survey: (1) Laboratory examination of the properties of the soil layers, including available plant nutrients; and (2) field testing of combinations of soil management practices. Then the soil survey gives a firm basis for setting forth the reasonable alternatives for each kind of soil, with the potential for its use.

The cultivator can be guided to soil and water management systems that give the highest long-time economic response for his labor and investment. Without such a soil survey the risks of new systems are greater than most can take.



- A1—Areas relatively unimportant for agriculture. Existing soil maps generally of little or no use for agricultural interpretations.
- B1—(B areas relatively important or potentially important for agriculture.) Existing soil maps generally of little or no use for agricultural interpretations.
- B2—Soil maps mainly useful for broad agricultural interpretations at principal level.
- B3—High proportion of soil maps, useful for moderately detailed agricultural interpretations at county level, are detailed or semidetailed and based largely on investigations.

From the Ends of the Earth—They

Learn About Conservation and Americans

By Jackson Bennett

ON a Monday morning in June of 1955 a quiet man unobtrusively joined 23 other men already seated in a classroom at the University of Georgia. Gaston Noroña could be excused for being late, for he had traveled a long way—all the way from the Andes Mountain area of Ecuador.

Noroña was the first trainee from another country to attend a regular session at the Soil Conservation Service Training Center, established in 1954 to train South-eastern-based SCS employees how better to help farmers and ranchers get conservation on the land. Thirty-five other students from other countries have attended the Training Center as a part of a program of help to qualified foreign technicians through the Agency for International Development, formerly the International Cooperation Administration.

The usual work visit to this country of AID-sponsored technicians is for about a year. The Training Center sessions take up only 3 to 5 weeks of this time, but the training is eagerly sought by students in the know. For example, Feliciano Garcia, soil scientist from the Philippines, attended the first 2 days of a training session while he was visiting the SCS State office in Georgia. Recognizing the importance of the training, he obtained AID permission to stay for the entire 5 weeks' course.

The trainees have come from 16 countries, led by Indonesia with 6 Center "alumni." Brazil and the Philippines have sent 5 each. Others have come from Bolivia,

Cuba, Cambodia, Nationalist China, Ecuador, Honduras, India, Korea, southern Rhodesia, Spain, Thailand, Turkey, and Yugoslavia. The Yugoslavian representative, Mrs. Zlata Anacic, graduate in agricultural engineering at the University of Zagreb, has been the only woman to attend; but she entered into all the scheduled activities, including field problems in engineer-

ing and soil surveys.

What do these people from other parts of the world learn at the Center? Garcia put it this way:

"All of us who attend the Training Center are interested in soil and water conservation and the work of the Soil Conservation Service. The training we receive there provides us with a sharp picture of the integrated program of the Soil Conservation Service. We also go away with a new concept of the basic science of soil and water conservation.

"The foreign trainee has been trained as an agronomist, engineer, biologist, forester, soil scientist, or other agricultural specialist. At the Training Center, he learns how each of these sciences fits together like pieces of a jig-saw puzzle to form the applied science of conservation farming. And this is something that can be put to good use in the severely eroded countries from which most of us come."

And many of the technical skills learned by the trainees have been put to good use back home. An outstanding example can be found in southern Rhodesia. Harold Roy Hack, known to other trainees as "Bob," attended the Training Center in 1955. "Bob" became interested in the land capability concept and the soil and capability map as a basis of farm planning. Returning home to Salisbury, he was instrumental in starting a soil classification similar to the one he learned about at Athens. Now, land capability classes are shown on the soil survey maps in southern Rhodesia, too!

Laxman Pandit, from India, while a student at the University



Gaston B. Noroña (left) of Quito, Ecuador, and Roem Purnariska of Bangkok, Thailand, at Athens Training Center.



Antonio G. Gomez (center) of Brazil helps make soil survey.

Note:—The author is Training Center supervisor, Soil Conservation Service, Athens, Ga.

of Georgia last year, became greatly interested in the Training Center program. He would come by and sit in on many of the technical exercises. Some months after leaving Georgia, Pandit wrote that he had enrolled at another of the Service's training centers.

"I just had to attend one of your full courses before returning to India, he said. "It is just the kind of training I can put to practical use there."

Two of the early graduates, Hoemala Harahap of Indonesia and Manuel Singson of the Philippines, have been active in starting in their own countries technical programs of soil and water conservation based on the training received at the ATC.

While attending the Center, the trainees live together in a hotel, with those from other lands paired with trainees from the Southeast. Lasting friendships have been es-

tablished in this manner. Chaitayna Patro of India observed of this aspect of the Training Center:

"I had really been misled about America and its people. After studying, working, and living with a group of 24 people from over the Southeast for 5 weeks, my concept of America has been radically changed. I've learned that America is really made up of people who are genuinely friendly and want to help us in other countries."

Soil Conservation Sticks In Taiwan and Burma

By Ira K. Landon

IN Taiwan the population is dense and the arable land is strictly limited in extent. These factors, along with the traditional Chinese veneration of the soil, cause the farmers of Taiwan to esteem their lands highly.

When the U. S. foreign aid program, working through the Joint Commission for Rural Reconstruction, offered technical and financial assistance in developing a soil conservation program in Taiwan, it was not surprising that the Taiwanese farmers responded wholeheartedly and readily accepted suggestions and ideas for conserving and improving their cultivated fields.

Starting from scratch in 1954, and working through and with the Provincial Department of Agriculture and Forestry, a soil conservation program suitable for Taiwan has been developed, local personnel have been trained, and an administrative organization has

been set up in the Taiwan Provincial Government. These steps were similar to those employed in development of the Soil Conservation Service in the United States.

Soil conservation field offices were established in 16 hsiens

(counties) in Taiwan, and in the watersheds of the major reservoirs. At each, a locally adapted program was worked out, and personnel were trained to apply and expand the program. Plots were established at research stations to



Bench terraces built by Kaosiung Hsien farmers after seeing work in Ah Keng Tien Soil Conservation Demonstration.

Note:—The author is former soil conservation adviser, Agency for International Development (formerly International Cooperation Administration).

measure soil and water losses under differing conditions. A personnel training center was established, and a training course in soil conservation was organized.

After the need for some centralized coordinating agency became apparent, the scope of the work was broadened, with the advice of a committee of all interested agencies, to include the development of the agricultural and range resources of the mountain areas; and an organization pattern was drafted. A new agency was named the Mountain Agricultural Resources Development Bureau, but the major part of its work is conservation and watershed protection.

During the 7½ years that the U.S. foreign aid program employed a soil conservation adviser in Taiwan, a number of local technicians were sent to the United States for soil conservation training. This instruction added to the training and experience they received in Taiwan, and produced a corps of technicians who are capable of supervising and further developing the program in Taiwan without a great deal of outside assistance.

The soil conservation problems in Taiwan are accentuated by: (1) The cultivation of very steep slopes, because of the population pressure forcing the farmers up the hillsides, in order to produce the food and other raw materials needed by the expanding nation; (2) the torrential character of rainfall during typhoons; and (3) the small size of the individual land holdings and the intensity with which they must be cultivated.

Because of these factors, the terracing, strip cropping, and crop rotation practices used in the United States do not provide adequate erosion control. The steep cultivated fields must be protected with level, bench-type terraces. Although expensive to build, they help prevent soil erosion, retain much of the water in the soil, and



"V"-shaped drag being used to build bench terraces near Kangshan in Kaohsiung Hsien.



First use of Fresno scraper in building level bench terraces in Taiwan—Ah Keng Tien reservoir watershed, Kangshan.

retain organic matter and plant nutrients that are washed off steep slopes. Waterways protected by vegetation or structures are used on all but the most permeable soils. On the latter, the water is retained by dikes until it percolates into the subsoil.

Mechanization on a broad scale has not been feasible in Taiwan, because of the steep slopes, the small size of the individual fields, and the limited resources of the farmers. Bench construction and other earthmoving jobs usually are done by hand labor, or with Fresno scrapers and V-drags made in the local shops and drawn with the farmers' own cattle. Since these tools were introduced by the soil conservation adviser, the Joint Commission has provided hundreds of them to the field offices, where they are lent to farmers ready to work on their own lands.

A similar program was instituted in the Shan States of Burma in 1951; but this project, along with the entire Foreign Operations Administration program, was terminated in 1953 at the request of the Union of Burma. At the time, 12 young Burmese technicians were being trained in soil conservation techniques.

In May 1961, the same soil conservation adviser (the author, Ed.) returned to Burma on temporary assignment. He was gratified to find that 9 of the 12 soil conservation trainees were still doing soil conservation work. Two of the other 3 had been promoted to higher positions. The 3 pickup trucks which had been provided by U. S. aid funds in 1952 still were in operable condition after 7 years of use, and the surveying equipment was in first-class condition. Data had continued to be collected from the runoff plots established in 1952.

In consideration of the administrative changes within the government of the Union of Burma, and the fact that the soil conservation work had been discontinued prematurely, it was significant to note that the research work had been carried on and that the fieldwork was still in progress, even though on a limited scale.

With the incomplete program in Burma carrying on under Burmese direction, and with local resources and the Mountain Agricultural Resources Development Bureau now organized and staffed to carry on the program in Taiwan with local personnel, it is evident that U. S. aid funds expended on these programs are bearing fruit. They need further refinements, as do such programs everywhere. But, in that local men have received training, as a result of which they are going ahead to conserve their natural resources, the objective of the foreign aid program to help these peoples to help themselves, is being accomplished.

3 Ways To Conservation—

Canada—New Zealand—United States

By William R. Van Dersal

IT is widely recognized that natural resource conservation problems tend to be similar in character the world over. Soil, water, plants, animals, and the products deriving from them present problems in utilization combined with appropriate protection that are familiar wherever they may be found geographically.

Solutions to these problems must be technical, economic, and administrative. Technically, for example, we may not know how to save a vanishing species from extinction, even though a government is willing to spend money on it. Economically, we may not be able to afford action on a flood problem, even though we know how, and the government is willing. And, in many instances, we find that, despite technical competence and availability of funds, existing governmental mechanisms are unable to do the job.

Possibly the most rapid progress in soil and water conservation is being made where all three of these factors—technical, economic, and administrative—are favorable. That is, specifically, in the United States, New Zealand, and the province of Ontario, Canada. In all three, there is technical competence, economic feasibility, and an administrative or governmental mechanism peculiarly designed to meet the problems and get the job done. Not only are the administrative mechanisms similar; but, as a group, they differ markedly from mechanisms used in many other state, provincial, or national governments.

The mechanisms include the soil and water conservation districts in the United States, the conservation authorities of Ontario (but not of other Canadian provinces), and the catchment districts of New Zealand. These three governmental or administrative mechanisms are similar in that they provide for local people to be essentially in full charge of their own local programs.

Each of them conducts its work with advice and help of federal and state (or provincial) agencies; but they are not merely local instruments for extending state, provincial, or federal programs. They do not serve in an advisory capacity to representatives of "higher-level" government agencies. On the contrary, the "higher-level" representatives serve in an advisory

capacity to the district or authority.

Local agencies such as these correctly may be characterized as the closest approximation to a true natural resource conservation agency that has yet appeared in the world. In state and national governments, there usually are many agencies, each dealing with a single natural resource. The work of these agencies is not necessarily coordinated and, indeed, frequently may be competitive.

The soil and water conservation districts, the conservation authorities, and catchment districts so far are not compartmentalized or segmented. They must deal directly with problems involving soil, water, plants, and animals in an integrated way. They must attack and solve the whole problem. It is almost impossible for



Waian Valley on South Island, New Zealand, where control of rivers rushing some 60 miles from high mountains across the plain to the sea is required.

Note:—The author is assistant administrator for management, Soil Conservation Service, Washington, D. C.

them to deal with a single resource: because the resources are too closely interrelated.

All of these three governmental agencies have proven notably successful. For example, studies indicate that the breadth of the program of Ontario's conservation authorities clearly is greater than that of districts in either New Zealand or the United States. Full attention has been given from the outset, not only to flood prevention, stream pollution abatement, and soil and water conservation, but also to a number of other related matters. Recreation has been given major consideration from the very beginning. So has wildlife conservation, which in this country has been given attention, but not necessarily in a primary way.

In addition, the conservation authority programs provide for the use of selected, purchased areas as community parks, for the preservation of important historical sites, the establishment of community forests, and, most remarkable of all, for the preservation and protection of natural biological areas of scientific value and interest. In contrast, recreation has been given little or no

attention in New Zealand catchment districts. This has been true, also, in soil conservation districts in the United States until recently.

New Zealand districts, meanwhile, are beset by complex and difficult problems of wildlife control. There, for example, deer, elk, moose, kangaroos, and Canada geese are on what we would call the "vermin list," because of the increased numbers of these introduced animals; and New Zealanders accordingly have been more interested in reducing these wildlife populations than in increasing them.

Community parks and forests, and natural area preservation are still not a part of the district programs either in New Zealand or the United States, but community parks are quite likely to develop in the United States as a result of recently expanded interest in recreation, both by the public and the Government. Similarly, the preservation of historical sites seems to be entirely foreign to the thinking of both American and New Zealand districts, though in Ontario the dedication of such sites may be attended with considerable publicity. Also, most soil conservation

districts in the United States have available historical information, and it is but a short step further to the preservation of more significant historical sites.

Perhaps breadth of program, as enabled in the laws, or as evidenced in the beginning works of the agencies, is really not in question. New Zealand catchment districts went to work first on river control, their worst and most difficult problem. They started work on the rivers, as authorized under their 1941 act; then in 1945 under an amendment to the original act, undertook the promotion of soil conservation. In 1955, New Zealand was still spending only 10 percent of its funds on soil conservation work, but this amount has increased steadily since.

In the United States, the reverse was true. The American soil conservation districts worked for many years on erosion control and land-use problems before flood prevention and watershed protection came into the picture. In Ontario, the earlier conservation authorities were formed in the first place because flood prevention was urgently needed. Soil conservation came soon, but not necessarily as a matter of primary emphasis.

In summary, it may be said that as their first-priority jobs have got under way, the agencies in all three countries have then begun to turn their attention to other phases of natural resource work. Powers being what they are under the enabling laws, it may be expected that a fully rounded program eventually should be a fact in all the three kinds of agencies.



The United Nations' Food and Agriculture Organization estimates that rodents, insects, and fungi destroy enough food every year to feed 250 million people for a year on a daily ration of about 2 pounds of cereal products.

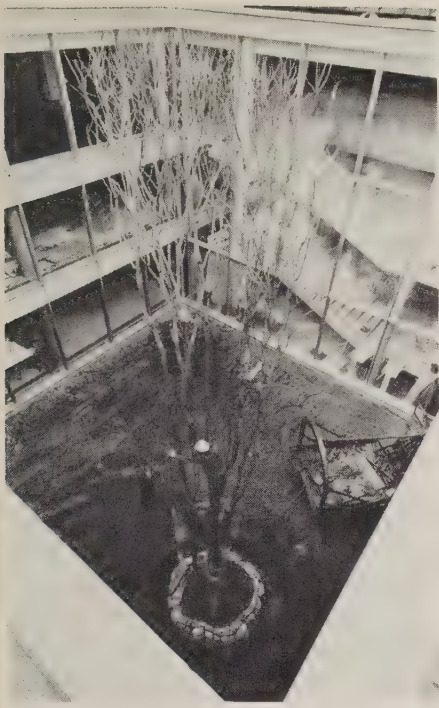


Boy Scouts planting trees on 7,000-acre forest of Ganaraska River Conservation Authority in Ontario, Canada.

Asia's Golden Rain Tree

Goes To College

By Melvin M. Thompson



Golden Rain Tree's new campus home.

A big Golden Rain Tree whose ancestors came from the Far East 2 centuries ago added new splendor to Washington University's campus in Missouri this summer. Set in the court area of the new John M. Olin library at the St. Louis institution, the tree will produce its yellow flowers each June for some 7,500 students. Its branches will push up to the third floor of the many-windowed library building, to be viewed perfectly either from the inside or out of doors.

The Golden Rain Tree (*Koeleria paniculata*) was introduced into the United States in 1763 from China, Korea, and Japan. When the Soil Conservation Service Plant Materials Center was established as a nursery at Elsberry, Mo., in 1934, a search was being made for plants to use on low fertility and severely eroded areas. Center Manager B. H. Slavin obtained Golden Rain Tree planting stock from the Department of Parks at Rochester, N. Y. The

trees did well, and a colony of 30 to 40 trees was established.

In recent years a clump of the trees served as a seed orchard for the SCS. Seed was collected and propagated for trials in northern parts of the Cornbelt, to determine the value for wildlife and wind-breaks, as part of the continuing search for better plants to meet a wide variety of conservation-planting needs.

The unique Oriental plant was the first choice of the landscape architect at the university, but the trees are so uncommon it appeared for a time that a substitution would be necessary. By a coincidence, the request came to the attention of Hugh S. Steavenson, a commercial nurseryman at Elsberry and former manager of the Plant Materials Center. At Steavenson's suggestion, university representatives visited the Center, where they found the very tree they wanted—a healthy specimen 35 feet tall. The State SCS office at Columbia approved the grant of the tree to Washington University.

The Golden Rain Tree is representative of the variety of plant materials being tested at the Elsberry Plant Materials Center. SCS specialists go to the ends of the earth to find plants that will do a better job of protecting the Nation's land from wind and water damage. About 6,000 different species of grasses, legumes, forbs, shrubs, trees, and vines have been tested and observed on the 273-acre area during the last 10 to 15 years.

Two of the better known of these plants that have made good are multiflora rose, used for "living" hedges and wildlife plantings, and Elsberry smooth bromegrass, used in grass waterway and meadow seedings. The Center also has developed methods now used in many commercial nurseries. For example, a direct seeding method was developed for taprooted nut trees, as was a technique for planting.

Principal users of tested products from the Center are the many cooperators in soil and water conservation districts in the nine Cornbelt States it serves. Seed and other materials are collected from plant introduction centers, experiment stations, individual farms, and other sources. Trained technicians compare them, and the more promising selections are studied further in small plots before being used in actual field plantings in the area.

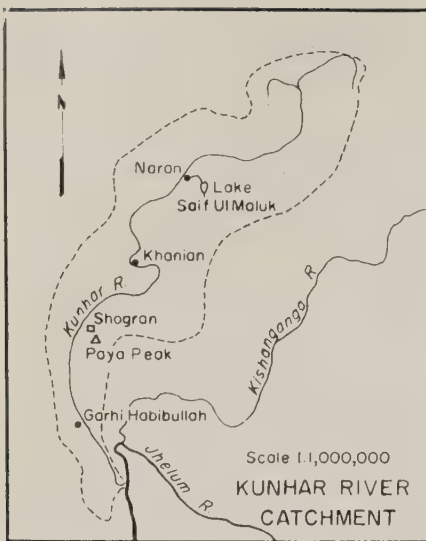


Golden Rain Tree grove.

Note:—The author is area conservationist, Soil Conservation Service, Fulton, Mo.

Snow Surveys In West Pakistan

By John E. Priest



A SNOW-SURVEY program was organized in 1960 for the 900-square mile Kunhar River catchment of the western Himalayas with Harza Engineering Company, International, assigned by the Water and Power Development Authority of West Pakistan to head up the program.

The Authority, known as WAPDA, is a semigovernmental agency formed to develop water resources for the country. Irrigation in West Pakistan is carried out annually on about 25 million acres. An organization dealing with water resources for such a vast area thus affects every member of the province of 40 million people.

Immediate objectives in these surveys, patterned after the snow surveys made in the United States by the Soil Conservation Service and cooperating agencies and private interests, are limited to developing data for operating reservoirs and power installations in the Kunhar Valley and to training Pakistani engineers in snow-survey techniques. If this program is successful, it may be extended to permit forecasts of runoff for much greater downstream areas.

Greater use and control of water

resources in West Pakistan was made necessary by the gigantic Indus Basin Settlement program, which also was entrusted to WAPDA.

In 1947, the subcontinent was divided into two nations—India and Pakistan—based on areas occupied by religious groups. The disposition of these groups had no relationship to geography. One of the most seriously affected areas was the land of the five rivers—the famous Punjab.

The irrigation system was intersected by the new national boundary, with control works and river headwaters lying in India and the commanded irrigation areas in Pakistan. It was apparent that each nation would require more autonomy in planning river development programs and carrying

out the projects. Agreement was finally reached after years of negotiations carried on through the World Bank.

Conditions in most of the Indo-Pakistan subcontinent make it impossible to obtain a usable relationship of snow-water equivalent and stream runoff. When Dr. J. E. Church, a pioneer in the United States snow-survey program, visited India in 1947 to help establish a program there, he found that low latitude and east-west orientation of the mountain barrier caused snow to accumulate above elevations of 12,000 to 14,000 feet. Snow courses had to be set up at these extremely high altitudes. But the ratio of monsoon to snowmelt runoff proved to be so great that influence of the snowmelt was marked. India aban-



Measuring snow on a West Pakistan course.

Note:—The author is hydrologist, Harza Engineering Co., Intl., Chicago, Ill., assigned to Lahore, West Pakistan.

done attempts at making water equivalent snow surveys about a decade ago.

None of the factors which limited the Indian venture into snow surveying appear to be significant, however, in the Kunhar River catchment in Pakistan. The survey area of Pakistan is in a narrow, V-shaped valley of the western Himalayas. The valley is shielded greatly from the heavy monsoon rains which hit the Punjab and foothill areas from July to September. Winter storms deposit several feet of snow on the catchment.

Snow courses consist of two sets—one of five courses and one of four—separated by about 30 miles. Courses vary from 7,750 to 10,600 feet high. Fiberglass soil-moisture units have been installed at each course. Other equipment at various courses includes precipi-

tation and storage gages. Summer rest houses near the bottom of each set are used during the surveys by crews. In each area, the top three courses are surveyed in 1 day—a round trip of 10 miles and a climb of 3,000 feet.

Seven Pakistani engineers, all employees of WAPDA, were trained in 1961 and 1962. These engineers are from the hot plains. Snow was unknown to them; but they adapted to cold weather work with relative ease. All are volunteers from the Surface Water Circle of WAPDA, which has responsibility for collection of hydrologic data in West Pakistan.

Three surveys were carried out in the Kunhar valley in 1961, and five in 1962. At times, the parties were 2 days from their motor transport, as the valley was snow-bound in higher reaches. It was

necessary to travel about 60 snowy miles, sometimes by walking and at other times by skiing. Soil-moisture and precipitation data also were collected at the snow courses in 1962; and streamflow measurement will be continued at three river-gaging stations in operation since 1960.

Snow surveys should be practicable and desirable in the Kunhar catchment, although several more years of collecting data are needed to confirm this. The present surveys also provide valuable training. Several other small catchments in northern Pakistan may also have requisite conditions for successful snow surveys. A long-term objective in this snow-survey program will be to explore the possibility of using snow-survey data for operation of the new Mangla Reservoir on the Jhelum River.



distinguished authors, with introductory and concluding chapters by the editor.

The arid zones of the world are divided in principal regions for purposes of the discussions: South-western Asia, India and Pakistan, Central Asia, Egypt, North Africa, the Sahara, South Africa, South-west Africa, Australia, and the western United States, each being given a chapter. There is a chapter about Pre-Columbian Central and South America; but, apparently, the chapter about Post-Columbian Central and South America failed to get to the editor in time for inclusion. In addition, there are chapters about: The Causation of Arid Zones; Climatic Change in Arid Regions Since the Pliocene; and Public Health Problems of Arid Lands.

This is perhaps the most comprehensive study ever made about the history of land use in arid regions of the entire world. It contains a wealth of information for the student of past and present land use in these regions. More-

over, the authors give detailed bibliographies at the end of each chapter for those who wish to pursue the studies further.

There is considerable discussion about irrigation methods and dry-farming methods, as well as of grazing and deforestation practices and their effects.

This reviewer commends the book to those who wish to make a study of these matters, but it is not suited for light reading.

—TOM DALE

A HISTORY OF LAND USE IN ARID REGIONS. Edited by L. Dudley Stamp. 388 pp. 1961. United Nations Educational, Scientific, and Cultural Organization (UNESCO).: Paris, France. (UNESCO Publication Center, N. Y.) \$10.50.

This large book is the 17th document issued by UNESCO in its Arid Zone Research Program. The preceding volumes dealt mainly with the scientific aspects of improving future agricultural production and human welfare in the arid and semiarid regions of the world. This volume is devoted chiefly to the history of past land use in these regions and the possible effects that past use may have on future use of these lands.

The book was written by 16

Have You Seen?....

● "The Big Conservation Job Is on Private Land," USDA's Picture Story 142. As the pamphlet illustrates, research, education, and technical and financial aid are the keystones of the Department's conservation programs carried on in cooperation with owners and operators of the Nation's preponderantly private land area.

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WORLD FOOD FORUM

(The World Food Forum commemorating the Centennial of the U. S. Department of Agriculture was held in Washington, D. C., May 15-17, 1962. A few representative quotations from papers presented at the Forum reflect the attention given to the importance of agricultural resource conservation in improving and sustaining world food production.—Ed.)

Secretary of Agriculture Orville L. Freeman: "In an underdeveloped agriculture the incentive of ownership is a powerful mechanism for the creation of capital from labor by such means as digging wells and ditches, clearing land, building roads or terraces or buildings and rearing livestock. Underemployed labor is thus transformed into capital assets. This impetus to productivity is not achieved where the farmer lacks the pride of ownership and the opportunity for gain from his added effort."

Paul G. Hoffman, Managing Director, United Nations Special Fund: "Physical and human resources are available in almost all the low income countries to bring to the peoples of those countries lives of decency and dignity. With every passing day at the United Nations new evidence comes to light of the enormous potentialities

in the form of physical resources, of great rivers whose waters are hardly being used, of tremendous forests that have never been inventoried, of mineral wealth that has never been tapped. Particularly impressive are the little used agricultural resources of these countries."

Henry A. Wallace, Former Vice President and Secretary of Agriculture: "When we learn how to develop our human relations as we have developed our agricultural productive capacity, when we learn how to retain the best traditions of our farms in an increasingly urbanized society, when we learn anew how to fire ourselves and our youth with a sense of moral responsibility and of purpose, then we will invent even newer techniques and build the new institutions needed in a hungry world threatened with self destruction."

Frank W. Notestein, President, The Population Council, Inc.: "The only hope that all men can secure adequate health, education, and relief from poverty lies in escape from a self-sufficient peasant agriculture. We must rely on modern technological knowledge and a sophisticated use of resources. Men cannot, otherwise, obtain a decent livelihood even for the present population—to say nothing of the much larger popu-

lations of the near future."

U.S. Senator Stuart Symington of Missouri: "The fertile soil of our country in the hands of our efficient and ingenious farmers has created a productive capacity which is and will continue to be an effective ingredient of our foreign policy . . . American agriculture has set an example which, if followed and adapted to the peculiar requirements of the underdeveloped nations, will be a potent force for achieving the age old goal of eliminating hunger from the world. This in turn will be no small contribution to the achievement of a more rational and, it is to be hoped, a more peaceful world."

Sir John Crawford, Director, Research School of Pacific Studies, Australian National University: "I want to suggest that during the next 40 years there will be a major food problem in the world and that the solution to it must be found during the first or, at best the first two, of these four decades. . . . I venture to suggest that just as the U. S. has given so freely to the world from its century of research and technological advance in agriculture, it must, during the next 10 years, lead and encourage all other Governments willing to work with it towards a world food policy."

SEPTEMBER 1962

Soil Conservation





Growth Through Agricultural Progress

Soil Conservation 25 Years Ago

"The Soil Conservation Service has an immediate and continued concern with the utilization of materials and weapons at hand, with the reestablishment of suitable cover on denuded areas, with the discovery and development of plants of superior erosion-resisting and economic qualities, with practices that will add to the value of existing pastures, and with cultivation for profits rather than losses."

"The Service has helped owners to plan over 50,000 farms. The primary objectives are the control of soil erosion by wind and water, and moisture conservation. In planning a complete reorganization of the farm for soil and moisture conservation, the economics of a well-balanced farm program must have consideration at all times . . .

"The success of the plan in operation rests on the practicability and crop balance in the agronomic program, the efficient use and management of forest land, and the economy of the farm reorganization."



COVER PICTURE—This picture of prosperity on a Tygart Valley SCD beef cattle farm in Taylor County, W. Va., shows the results of using the land for its best purposes—pastures and hay, woodlands, and ample water.—Photo by Everett P. Leadbetter.

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Soil Conservation

ORVILLE L. FREEMAN
Secretary of Agriculture

DONALD A. WILLIAMS
Administrator, Soil Conservation Service

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FRANK B. HARPER, Editor

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The Broadening Challenge Of Soil and Water Conservation

By Donald A. Williams

SOIL and water conservation as we know and practice it today is an across-the-board operation resourcewise. Federal, State, and local agencies and private interests have recognized this fact more and more in authorizations and actions taken for dealing more effectively with our soil, water, plant, wildlife, and recreational problems on a cooperative basis.

We can appreciate the breadth and depth of the Nation's conservation efforts when we consider the major undertakings established in this field: Soil conservation district programs; small-watershed protection and flood prevention projects; the Great Plains Conservation Program; the Agricultural Conservation Program; Rural Areas Development programs; farm recreational and other undertakings on non-Federal lands.

Soil and water conservation long since has outgrown the "gully plugging" stage. Today, it embraces every element of private land use and water management, from the most remote western livestock ranch to the easternmost suburban "strip" extending down the Atlantic seaboard.

Whether we are dealing with land for farms, forests, wildlife or recreational areas, suburban or other developments, it behooves us to use every parcel of land we possibly can for the purpose to which it is best suited. We have been blessed in this country with abundant land resources. We have used a good deal of our land badly in the past; but we are making gratifying progress as a nation in wiser use of our land and water resources.

It has been amply demonstrated, through soil and water conserva-

tion planning and treatment, that there are alternative uses of our land which the people who occupy and control that land must decide for themselves. We must think in terms of multiple, harmonious uses of our land and water resources.

This approach to one of the Nation's most basic problems involves decisions, and planning, by land users themselves—on individual farms and ranches, in soil conservation districts, in watersheds, in suburban areas, and wherever. It involves planning bolstered by technically sound facts developed during more than a quarter of a century of soil and water conservation research and on-the-land application of modern conservation technology.

Agriculture—including, importantly, the management of land and water—depends as never before upon sound scientific approaches to its problems in this space age of the 1960's. We no longer can afford to let Nature take its course, to rely upon rule of thumb methods of managing these resources, or to keep our eyes closed to mounting problems of land use and water management. A premium has been placed upon the most productive and efficient use of these resources.

Beginning in November 1960, SOIL CONSERVATION has devoted its monthly issues to specific technical and related components of the broad soil and water conservation program the Soil Conservation Service is charged with helping to carry out, as the agency of the Department of Agriculture responsible for technical and related services in this field. These issues of the magazine have now

covered virtually every phase of the Service's activities.

In opening the special-issue series, I wrote: "Today's rapidly changing agriculture—larger farms, increased mechanization, vertical integration, greater emphasis on management skills, and the shifting of farmland to non-agricultural uses—provides the setting in which we must carry forward the soil and water conservation job." How true that still is today!

During this period of about 2 years, we have examined in successive months these topics of interest to all who are concerned with soil and water conservation, including a number of which are reflected in articles in this issue. New methods for new problems—soil surveys—conservation range management—farm and ranch conservation planning—wildlife conservation—watershed planning and treatment—grassland farming—conservation on farm woodlands—conservation engineering measures—water conservation—cropland conservation—technology and machines in speeding conservation—the Great Plains Conservation Program—soil conservation districts—rural areas development—suburbanization—recreation and wildlife in outdoor preservation—plant materials—conservation needs—U. S. D. A.'s centennial from the conservation standpoint—conservation education—and conservation around the world.

Together they reflect today's multiple use of our land and water resources and the basic role that soil and water conservation has in insuring the ability of those resources to meet the Nation's needs in the future.

"Twice As Many Cows Twice As Easy"

By Clarence Kelley

RANCHER Ray Smith has a lot going for him today after a dozen years of good land use in Washington's breaks of the Snake River near Hay.

Since 1949 he has: Stepped up his cow herd from 120 to 230 head. Cut his acreage of poor condition range sites in half. Increased the number of top producing range sites more than 12 times. Established 145 acres of permanent summer irrigated pasture on a once barren, sandy river bar.

Smith laid the ground work for these and other gains soon after a Soil Conservation Service technician surveyed his land in the Whitman County Soil Conservation District.

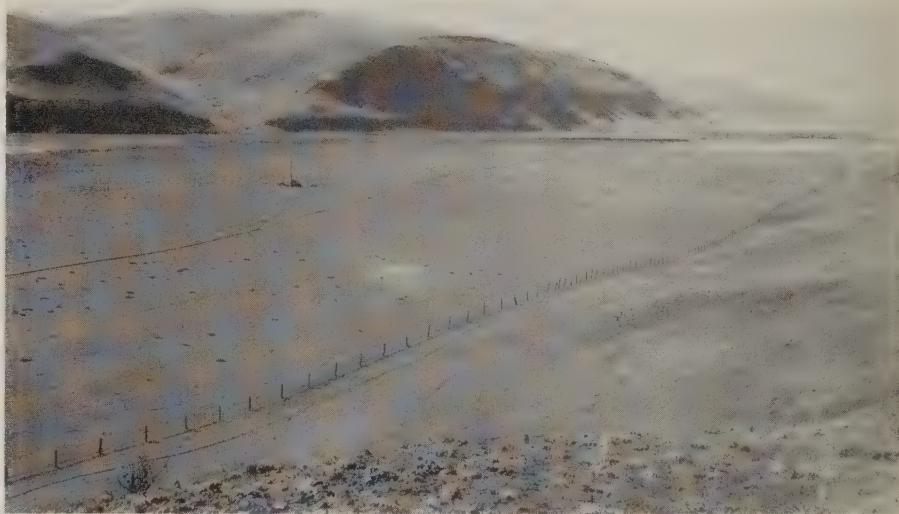
The survey, which included reference to a soil survey map and an aerial photograph of the ranch, showed that only 2 percent of the grassland produced at peak capacity and provided maximum soil protection, 33 percent was in good condition, 53 percent was in fair condition, and 12 percent produced poorly. Figuring the feed potential of such key forage grasses as Bluebunch wheatgrass, Idaho fescue, and Sandberg bluegrass, poor range was turning out less than a fourth of what it should. Also, there was no good summer range; stock water was short, and the large size of some of the pastures made it impossible to defer and rotate grazing.

The soils map showed a 145-acre piece of low-lying benchland that might be adapted to irrigated pasture. Smith's first step was to drill a 320-foot well, with a capacity of 1,200 gallons a minute.

More than a mile of 6- and 8-inch permanent irrigation main lines were buried, and 5,000 feet of 3-inch aluminum laterals were installed. Sprinkler heads supplying 6.2 gallons a minute were placed at 40- by 60-foot spacings. The

entire system required a 950-gallon-a-minute turbine pump, operated by a 75-horsepower electric motor.

Today that formerly barren, low-lying bench is high-producing irrigated summer pasture, divided



Low-lying, barren and sandy bench before development.



Some of Smith's new summer irrigated pasture on the same land.

Note:—The author is work unit conservationist, Soil Conservation Service, Lacrosse, Wash.

into four main units seeded to a mixture of smooth brome grass, alta fescue, orchardgrass, white Dutch clover, and birdsfoot trefoil. Each main pasture is subdivided into four lots, each of which is grazed for 6 days and given a recovery period of 18 days. With this rotation system, the grass is never harmed by overgrazing. At an annual operating cost of \$10 an acre, the irrigated pasture solved the summer feed problem; but to provide hay, another plot of land also was irrigated, and seeded to Ladak alfalfa. It is never pastured.

Eight miles of additional fencing was needed for the new system of management. In order to have water in each of the dryland range units, Smith developed three springs and installed watering troughs. As a result of his conservation development, Smith now has five units managed under a rotation deferred system where 12 years ago there were only three dryland range units.

He normally begins using his



Smith (right) and Jim Hopkins check range after summer's rest from grazing.

irrigated pasture by May 1, so that most of his range is deferred and allowed to produce viable seed.

His cows are turned from the irrigated pasture back to dry range in October. Each time a different range is used. Many of the low-producing range areas were plowed and seeded to intermediate wheatgrass, and are producing four times the feed they yielded

before. In contrast to its 1949 production, 25 percent of Smith's rangeland now is rated as excellent, 38 percent as good, 27 percent as fair, and only 6 percent as producing poorly, with 4 percent reseeded.

The payoff on his pasture development and range improvement and management system is a gain over 1949 of 67,000 pounds of extra beef annually, plus an additional 100 head of cows he now can run on the same acreage.

"It wasn't easy," Smith said. "Our conservation plan helped us a lot when we had our goals set. I can remember times when I thought we would never make it. One year we seeded that barren sandy soil three times, and each time the wind blew the seed away. But the fourth time she stayed. Today we have one of the finest pasture stands you could ever hope for. You know it really seems odd, but now I can run twice as many cows twice as easy as I could a dozen years ago."

TERRACING

Old Practice Goes Modern

By Ivan McKeever

MODERN terraces etching the cultivated countryside from coast to coast are an outgrowth of the ditch-like terraces first used in this country in the late Colonial period.

Terracing, one of the first measures to be used in soil and water conservation land treatment in the 1930's, is recorded as having been practiced for the first time in Pennsylvania by John Lorain, ardent conservationist, who began farming near Philipsburg in 1812.

He described the practice in his writings by pointing out that there were systems of water diversions constructed on his farm after careful survey, according to the lay of the ground. He believed they should be laid out properly, even though sometimes it was necessary to run them in "serpentine" courses.

The ditch method of diversion terraces was improved upon in the early work of the Soil Conservation Service. However, many of these early terraces were narrow and deep, making it impossible to



A typical modern broad base diversion terrace easy to work over with farm equipment.

cross them with farm machinery.

Constant effort has been made by Service conservationists in Pennsylvania to improve the design of diversion terraces to make them more applicable to modern machinery-farming. The steep and

Note:—The author is State conservationist, Soil Conservation Service, Harrisburg, Pa.



Then.—Diversion terraces being built by hand on Lancaster County, Pa., farm in early demonstration project days.



Now.—Large machines are used today to build broad base diversion terraces like this one in Perry County.

hard-to-manage diversion terrace of the early days has been modified so that today's farm equipment can operate over properly built broad-base structures, now to be found on hundreds of farms in the State.

Farmers' liking for diversion terraces in Pennsylvania has been closely associated with the change in their design. In 1946, 93 miles had been built to handle water runoff, while at the same time enabling farmers to continue harvesting their crops with such modern farm machinery as side delivery rakes and hay balers. More than 3,000 miles of these diversion terraces

now have been built in Pennsylvania. Because many more miles are needed, the rate of building them undoubtedly will continue to be speeded up.

To facilitate the layout and construction of these broad-base diversion terraces, a construction guide was developed that calls for cross sections large enough to carry runoff water, and broad enough to enable farmers to perform their necessary management and tillage operations without impediment.

"You don't have to worry about losing land through the use of diversion terraces," says Royal Champluvier of Bradford County.

"In 1960, for example, one of my 800-foot-long diversions yielded 250 bales of trefoil hay. This yield was equal to the yields I normally get from all the rest of the fields."

So it is that the diversion terrace has proved to be a key practice in the development of a well-balanced soil and water conservation program in the Keystone State. Diversion terraces not only control erosion, but they also are effective in improving drainage on many soils. Properly spaced diversions have improved drainage remarkably in most instances.

Typical of comments by Pennsylvania farmers who have built these terraces is that by Emmons Harvey of Wyoming County, who has put in 10,000 feet of diversions on his 200-acre dairy farm: "Through the use of these diversions, I have been able to get on my fields at least 2 weeks earlier in the spring, and they are some of the most productive areas on my farm."

"These terraces," says Orton Mattocks of Bradford County, "have also helped reduce erosion considerably."

Diversion terraces also are popular with Pennsylvania farmers on better drained soils. More and more of them realize that these structures dividing the fields into smaller watersheds will greatly reduce damage by surface runoff. Oliver Grove in Huntington County, for example, has built more than 5,000 feet of diversion terraces on his farm.

"The purpose of the terraces," he said, "is to protect the land from heavy storms, which have caused considerable soil washing in the past. The diversion terraces now control this excess runoff."



About 2 million of the 4.6 million farms in the U. S. produce 90 percent of our agricultural products; the remaining 2.6 million farms produce only 10 percent.

“Crawdads” Are Crayfish —and Vice Versa

By Carl H. Thomas

THE lowly “crawdad” that served as bent-hook fishing bait for a retiring generation is coming increasingly into its own on epicurean menus as “crayfish” produced as a bona fide conservation farming crop.

A rotation of rice, crawfish, as the fresh water crustacean is commonly known, and pasture is producing as much as 700 pounds of edible crawfish an acre on lands in southwest Louisiana. Until recently, natural swamps, floodways, and bayous have been the source of this seasonal delicacy. Now, it is being grown in fields managed specifically for its production in rotation with rice and grass.

Soil Conservation Service conservationists are helping farmers develop plans for working crawfish into their rice rotations. Such planning and land use is a farmer decision based on a consideration of the capability of each acre of his land. Rotations like this, and other land-use and conservation practices needed, are part of basic conservation plans for entire farms.

A typical “crawfish field” starts out as native pasture. The pasture is plowed and planted to rice in the spring. When the young rice is 4 to 8 inches high, the field is flooded with from 6 to 18 inches of water. It remains flooded until late August or early September, when it is drained and the rice is harvested.

Immediately after harvest, the stubble and straw is flooded with from 12 to 30 inches of water pumped from deep wells, canals, and bayous, and the water is maintained at this level. The rice stubble provides food for the crawfish, both

directly as it decomposes and indirectly by increasing the growth of aquatic plant and animal life. The crawfish grow rapidly when the water begins to warm up in early spring, and have been known to grow as much as 3 inches in a month. They usually are big enough for the crayfish market by February or March; and at the end of the crawfish season in June, the field goes into pasture until rice is planted again.

People of all ages walk the rice levees “crawfishing” with traps, small nets, poles, and buckets. For commercial fishermen, it is a profession. They use 4 to 6 cylinder-type traps to the acre, baited with fish, beef melt, or other bait. The traps are placed at random in the field and are checked once or twice daily. They usually yield from 1 to 5 pounds of “crawdads” each time they are lifted.

This kind of water management is giving rice farmers added income and land-use alternatives. The crawfish “cropping” also seems to reduce weeds and smooth the land. Beforehand planning and field selection are “musts” in producing crawfish in rotation with rice. A field should have a resident population of the red-swamp crawfish, or it may be stocked with egg-bearing adults while the field is flooded during May or June.

Fields on which the rice is harvested in August or early September appear to grow more and bigger crawfish, when the water level is maintained over the stubble during the winter at a depth of 12 to 30 inches—the deeper, the better. The fields selected normally have rather high outside levees.

Additional management tech-

niques, such as fertilization of the water, water fluctuation, and stocking, are being tried by soil conservation district cooperators at the present time. These pioneers in crawfish farming are extremely interested in this added operation, because they believe it is one more wise soil and water use for their lands.



A 26-acre ricefield on Gilbert farm flooded for growing crawfish. Between 10,000 and 15,000 pounds of crawfish taken from this field sold for 15¢ a pound.



These 250 pounds of crawfish represent a half-day's catch from a 38-acre ricefield flooded after rice harvest. (Owner Bert Gilbert, right.)

Note:—The author is biologist, Soil Conservation Service, Crowley, La.



Top l.—Buchanan on rootplowed and seeded land at end of first season.

Top c.—Cox on rangeland heavily infested with mesquite.

Top r.—Houston (and son Kenneth) checking grain sorghum residue.

Lower l.—Crawford in small grain grown for cover and soil improvement.

Lower r.—Shaw examining residue from harvested sorghums.



5 District Supervisors— 5 GREAT PLAINS CONTRACTS

By W. S. Goodlett, Jr.

MEMBERS of the board of supervisors of the Martin-Howard Soil Conservation District in Texas practice what they preach. Every one of them has a Great Plains Conservation Program contract to help him carry out a complete conservation program on his land.

Another 131 district cooperators had cost-sharing Great Plains Conservation Program contracts as of July 1 this year.

Each of the Great Plains Conservation Program contracts provides for the establishment of a complete conservation program, developed with technical help of the Soil Conservation Service. Cost-shares are allowed for permanent-type practices such as cross fences, livestock water wells and storage facilities, brush control, underground irrigation pipelines, seeding of grass, and terracing.

Chairman Jack Buchanan of Big Spring has a contract on his stock farm, which includes 348 acres of grassland and 594 acres of cropland. He uses a conservation cropping system for his cotton,

grain sorghum, small grain, and sorghum alum; practices crop residue management; and has built terraces and practices contour farming for water conservation and erosion control.

Twenty-three acres of the pastureland, on which he follows conservation use, were rootplowed to control the mesquite trees and seeded to a mixture of blue panicum and side-oats grama; and 145 acres will be pitted and seeded to side-oats grama and Caucasian bluestem grasses. To provide water for his registered Herefords, Buchanan drilled a well.

Vice-Chairman Bob Cox of

Note:—The author is area conservationist, Soil Conservation Service, Big Spring, Tex.

Tarzan has a contract on his stock farm, which has 400 acres of cropland, 300 acres of it irrigated, and 943 acres of rangeland. He also uses crop rotation and residue management, and planned to terrace the dry cropland. His plan also includes reorganizing his irrigation system to cut water loss, including installation of a high-pressure underground main line for the sprinkler system. He grows cotton, grain sorghum, forage sorghums, and small grain. Cox plans to control mesquite trees with aerial spray of 2,4,5-T so he can improve his grassland through deferred grazing and proper grass use.

Secretary of the Board Bernard Houston of Stanton has a contract on his combination farm and ranch including 3,619 acres of rangeland and 536 acres of irrigated cropland. Mesquite control has included 1,305 acres of rangeland rootplowing and seeding, and 1,353 acres of treatment with 2,4,5-T. His other grassland improvements include building cross fences, drilling wells, with storage tanks, and practicing deferred grazing and proper use.

His crops are cotton, alfalfa, and sorghums, grown in rotation. His sprinkler irrigation systems likewise are being converted to underground lines.

The contract of Board Member J. D. Crawford of Midland is on his farm of 160 acres of irrigated cropland and 149 acres of cropland that is dryland farmed. Twenty-four acres of the irrigated cropland will be converted to a bermudagrass pasture for livestock. Crops grown on the cultivated land are cotton, grain sorghum, and small grain; and he also uses crop residue management. His reorganized sprinkler irrigation system likewise will have an underground main line.

Larry Shaw of Knott, the other member of the soil conservation district board, has a 480-acre dryland farm that is all in cropland.

With help of his Great Plains Conservation Program contract, 135 acres will be planted to a mixture of blue panicum, plains bristlegrass, and green sprangletop to provide for grazing of livestock; and part of the cropland will be used to grow forage sorghums for

silage.

Shaw's other conservation measures include crop residue management, cotton strip-cropped with sorghums to furnish additional protection against wind erosion, and a well drilled for livestock water.

The "Second Frontier" Today

By Emil E. Ebert

IT was a decade and a half ago that the conservation face lifting of two rundown farms in Licking County in Ohio was billed as the "Second Frontier."

The event attracted people from all over Ohio and neighboring States. The late Hugh Bennett, father of the modern soil and water conservation movement and first chief of the Soil Conservation Service, was the featured speaker; and a monument was erected in honor of this pioneer conservationist.

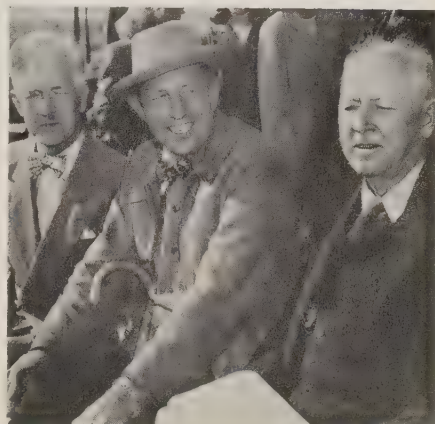
Now that conservation farming has spread across the Nation, and a lot of water has gone through the spillways of thousands of conservation dams, many are wondering what is left of all the commotion of the "Second Frontier." The two farmers on whose land the event was held recall the story of the event that took place at the highest elevation in Ohio, along the nearly 50-mile long Old National Trail, now U.S. Route 40. They recall, for instance, that it was a bright day in October, with bands playing the National Anthem, and thousands of people standing at attention during the raising of the flag as the historical conservation event began.

Here, in one day, hundreds of local farmers and townspeople accomplished what it would take the

average farmer years to get done. Diversions, ponds, and waterways were built. Fences on the farms were removed and replaced to fit the contour strips that had been laid out. One unusual event was re-locating a property line fence to follow the contour of the land. It required a change in the deeds of two farms!

John Rodman still is owner of the farm divided by the Old National Trail.

"Contour farming really pays off in the hilly farm sections," is the way he describes the results. "It's much easier to farm with the contour of the land than to fight soil erosion.



Conservation VIP's at "Second Frontier": Late author Louis Bromfield, general chairman of event and former Friends of the Land president, flanked by former SCS Ohio State Conservationist Tom Kennard (left) and late SCS Chief Hugh H. Bennett.

Note:—The author is soil conservation aid, Soil Conservation Service, Newark, Ohio.



Before.—Almost useless swampy area on Rodman farm at time of "Second Frontier."



After.—The area today with farm pond and pine trees and multiflora rose wildlife planting.

"In 1946, our corn yield was 50 to 60 bushels an acre, and our wheat yield was 15 to 20 bushels an acre. Now, after the 'Second Frontier,' our corn yield has increased to 80 to 100 bushels an acre—even better some years. The wheat yield has jumped to 25 to 30 bushels to the acre. Our grass and legume yields have been much better than ever before. The water from our springs has increased.

These springs alone are worth their weight in gold."

Hundreds of people have visited the Rodman farm since the "Second Frontier," and many farmers since have changed their methods of farming.

Bob Latham, son of the owner of the other farm at the time of the "Second Frontier," now is its owner and operator. It was on this farm that the most severe erosion

had taken place.

"The gullies on parts of our farm were so deep we could hardly get farm machinery around," he recalls. "Now these areas are level, and the raw areas are covered with heavy grass sod or planted to trees. The contour farming and diversions have helped us keep the soil in place on the cropland fields. Our soil fertility has increased to where we can get a good return from the farm. We have had many people visit our farm from Ohio and surrounding States, and many from much greater distances. Included are classes of high school and university students."

Photographs of the land as it was in 1947 tell the story of the change from the past to today. Where there once was a swampy area of no value, for example, there now is a conservation farm pond surrounded by about an acre of pine trees and multiflora rose. This planting has increased the wildlife population on these farms and the surrounding areas. Many people come to the Rodman and Latham ponds each year to fish. Mrs. Rodman told of seeing five deer on their lawn early one morning.

On the Latham farm, where there used to be gullies 4 feet deep, the land now is covered with pine trees. Their survival has been good, and are serving their primary purpose well in stabilizing the soil on this gullied hillside, in addition to growing into merchantable timber.

Multiflora rose fences, meanwhile, are growing vigorously on both farms. Latham remarked that these living fences have a two-fold purpose: They provide an economical fence; and they make a home and provide food for such wildlife as rabbits, quail, and songbirds.

Thus the effects of the "Second Frontier" have spread throughout Ohio's Licking County, and those who started this action have remained true to their pledge to use wisely and well the land that their forefathers brought under the plow a century and a half ago.

Intensive Pasture Management Pay\$

By Glen E. Murray

MURRAY Webb, a cooperator with the Dixie Soil Conservation District at St. George, Utah, sets a pattern in pasture operations for many dairy farmers of his area.

Murray planted his first pasture in 1951, and, to put it in his words, "The mixture was a poor one containing about everything in the book." The composition of this pasture has changed over the past 10 years, because of different types of grazing operations; but a good balance of grasses and legumes is now being maintained, and "it gets better each year." The principal species are Ranger alfalfa, ladino clover, Lincoln brome-grass, and orchardgrass.

Mr. Webb divided his 8-acre pasture into four 2-acre plots for grazing management purposes. The plots are grazed by the "strip" method. This is accomplished by moving an electrically charged wire "up" the 2-acre strip about 5 rods each morning and evening. This method has proved to be the best so far used by Webb, who is always looking for a better way to do things. He planted two of the strips to Latar orchardgrass, Liso brome-grass, and Ranger alfalfa for grazing the first time this year,

Note:—The author is agronomist, Soil Conservation Service, Salt Lake City, Utah.

and likes the new mixture better than that on the other two strips.

Webb's 27 milk cows graze the 8 acres for at least 7 months each year. They are not just average cows; during 1961 they produced 570 pounds of butterfat per cow (15,034 lbs. of milk) on DHIA test. In addition, the cows are followed on each pasture plot by a dozen bred heifers for 2 days before the pastures are clipped and irrigated.

Webb gears application of fertilizers strictly to the needs of the pasture plants for maximum production of high-quality forage. He applies approximately 20 tons of barnyard manure to the acre annually, and this is often supplemented with commercial phosphate or nitrogen when it is needed to maintain a balance of grasses and legumes.

Irrigation water is available "on call," and is applied by the border method, in accordance with the needs of the plants and the soil. The soils are uniform in their water-holding capacity. The principal variable, insofar as soil, water, and plant relations are concerned, is the variation in temperature during the growing season. Irrigation water is generally applied twice between grazings, and the



Part of a freshly grazed pasture in the foreground with a pasture in the background awaiting grazing.

pastures always are allowed to dry out a couple of days after irrigation before being grazed. This precaution prevents excessive compaction.

The Webb cows have free access to water and shade, and he keeps dry hay available to them at all times. He pridefully says:

"With 20 cows and 12 heifers grazing these pastures in 1960, I still had more surplus forage to cut and bale when clipping than I had when I was grazing 6 fewer animals. This amounts to about 200 bales a year. My improved pasture is the best money-making crop per acre that I have ever grown, and that includes sugarbeet seed, alfalfa hay, small grain, and silage."

The cost-return ratio, supports the soundness of Webb's management program. It also is apparent that all basic management items are being considered in his pasture program. When you get this kind of plant, grazing, irrigation-water, fertility, and livestock management, it pays off.



More than 54 million people live in rural areas in the U. S.



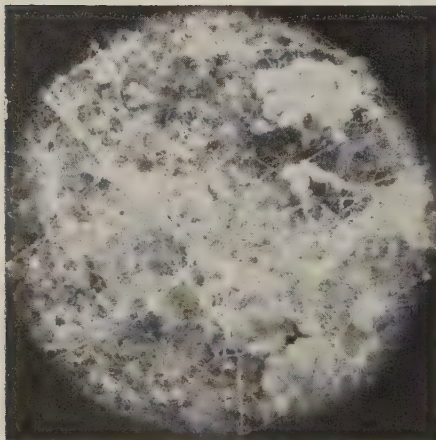
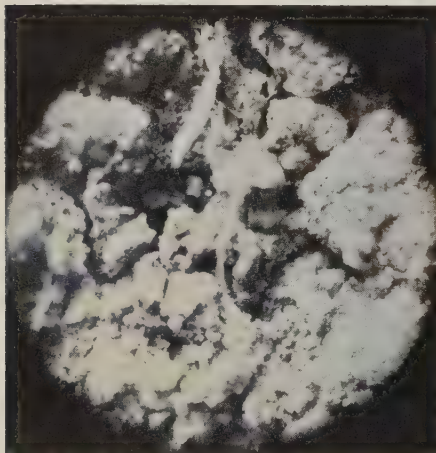
Dairy cattle grazing one of Murray Webb's improved pastures.

Microorganisms and T

By T. I



Structure of surface and subsurface soil (magnified 12 times). 1.—Peorian loess, showing lack of granulation; 2.—surface soil with good granulation.



Fungus mycelia growing in soil and binding it into stable aggregates (magnified 12 times).

EACH spoonful of a fertile soil contains more living microscopic organisms than there are people on the earth—some 3 billion. These microorganisms include microscopic plants, such as bacteria, actinomyces, and fungi; microscopic animal life, such as protozoa and nematodes; larger organisms such as earthworms and insects; and many other living things.

Microorganisms with their enzyme systems act as a digestive system and spread throughout the soil, having contact with every soil particle and plant root. Microbial activity is particularly intense around a plant root. Whenever plant or animal residues are returned to the soil, they are broken down by this teeming microscopic population, if soil conditions are favorable. The materials remaining after decomposition are carbon dioxide, water, nitrates, phosphates, sulfates, and salts of calcium, magnesium, potassium, and many trace elements. Many organic substances are produced during residue decomposition. Some influence plant growth.

Soil conditions affect the activity of microorganisms. For example, if the soil is frozen, little activity takes place. Optimum temperature for microbial growth is about 75-85° F. However, some microbial activity takes place at 40 to 60° F.

Oxygen is needed for the growth of beneficial microorganisms. Too little oxygen in the soil may encourage the growth of anaerobic microorganisms which reduce the iron, sulfates, and nitrates. The soil may become gray because of reduced iron; nitrates (through denitrification) may be lost, and the sulfates may be reduced to hydrogen sulfide, which is toxic to

plants.

Microorganisms need inorganic nutrients such as nitrogen and phosphorus. They also need organic substances, such as plant residues, for energy. Given a suitable environment and food, they will grow and reproduce.

Growing microorganisms perform such beneficial functions as decomposing plant and animal residues, liberating nutrients for growing plants, and stabilizing soil structure, important in soil and water conservation. Some of the undesirable influences of microorganisms are in the "tie up" of nitrogen and phosphorus during decomposition of cereal crop residues, conversion of sulfates to hydrogen sulfide, or the loss of nitrogen from the soil by denitrification. They also may compete with crop plants for the available nutrient supply.

Microorganisms vary greatly in their ability to stabilize soil aggregates. Some, like *Stachybotrys atra*, are highly effective, but most of them have only a moderate effect. A method is needed to utilize these few organisms that are effective in decomposing crop residue.

Under laboratory conditions, some microorganisms produce organic compounds, such as antibiotics, which control the activities of other microorganisms. Also, some microorganisms produce organic chemicals which influence plant growth, such as gibberellic acid. Microorganisms grown on agar plates produced substances which caused the roots of germinating corn to grow upward. Many plant residues contain organic compounds which influence plant growth. Research is needed to learn whether these substances are produced by microorganisms in the

ir Activity in the Soil

Calla

soil and in sufficient quantities to affect plant growth.

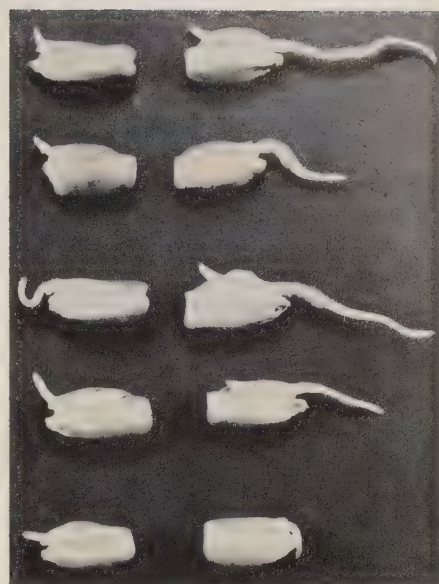
Microbial activity can be controlled to some extent by the placement of residues in and on the soil; by the kind and amount of residues added, moisture control by irrigation, and temperature manipulation by mulching; and by the addition of fertilizers. Eventually it may be possible to control microbial activity even more, in order to regulate nutrient supply and provide soil conditions for maximum effects on plant growth.

Today, several chemicals are widely used on the farm to control disease organisms and insects. Eventually it may be desirable and possible to go a step further and entirely eliminate the existing soil flora by sterilization; then superior microbes could be added to the soil, such as highly effective soil stabilizers, better nitrogen fixers, nitrifiers, and possibly microorganisms which produce plant growth regulators, or chemicals which

might reduce plant disease.

Every management practice influences microbial activity; and, conversely, microbial activity determines how well a management practice works. An example of an effective soil and water conservation practice is stubble mulching. The crop residues are a food for microorganisms. As a result, the number of bacteria, fungi, actinomycetes, nematodes, denitrifiers, and earthworms are increased in the surface inch of soil, where the activity of the microorganisms increases stability of soil aggregates and the organic matter, total nitrogen, and acid-soluble phosphorus increase.

Nitrogen and other nutrients may be tied up and be unavailable to crop plants. Substances toxic to plants appear to be produced under stubble mulching conditions. In some cases the residues themselves contain substances which affect plant growth. As a result of microbial activity, crop yields on



L.—Root sprouts of corn germinated on peptone plates in presence of microorganisms turn upward; r.—control seeds germinated on Crone's medium.

No. 68

This is the sixty-eighth of a series of articles to appear from time to time in explanation of the various phases of research being conducted by the Department of Agriculture on problems of soil and water conservation.



Stubble-mulch residues stimulate growth of soil microorganisms and help control soil erosion.

stubble mulching are often slightly less than those on plowing.

Thus, many of the cropping and tillage practices that a farmer uses in a conservation program are effective in crop productivity because of their influence on microbial activity. Legumes that are well nodulated are turned back into the soil to increase available nitrogen for the following crop. When the soil is tilled, aeration is improved and conditions made favorable for the growth of the nitrogen-, sulfur-, and iron-oxidizing organisms.

Note:—The author is microbiologist, Agricultural Research Service, Lincoln, Nebr.

FFA BOYS GET LOWDOWN

On Woodland-Range Conservation

By Thomas N. Shiflet and Clinton L. Harris

TIMBER and grass are the two most important crops in Louisiana's Calcasieu Soil Conservation District around Leesville. That is why the district has carried on an educational program on soil, water, and plant conservation with youth groups since 1950.

"Well-trained youth is the key to our future agriculture," says Robert D. Schaefer, chairman of the district's board of supervisors.

The newest phase of the district's youth work has been on grazing management of pine woodland. The district is located in the heart of Louisiana's longleaf pine belt, where the natural vegetation con-

sists of an open stand of pine trees and an abundant understory of grass. The area has been used for cattle grazing since it was settled by white men. There are approximately 1½ million acres in the district that will produce livestock and timber at the same time, and the area's economy is geared accordingly.

The woodland-range management program was started in 1960 with the seven FFA Chapters in Vernon Parish, with a September tour at the West Louisiana Forest Festival. Important native forage plants were identified and discussed as to their forage and erosion control values as indicators of range trend, and other values. At the end, a contest was held and identification of the plants discussed.

Note:—The authors are respectively, range conservationist, Lake Charles, La., and work unit conservationist, Leesville, La., both of the Soil Conservation Service.

The winner from each school was presented an award by the district.

In 1961, the program was continued with a summer tour and contest on the B. A. Graham ranch south of Leesville. Here, the boys and their teachers observed an actual conservation operation that included the management of timber and range forage in keeping with land capability. Many of the boys and teachers took time out from their summer vacation to participate. Two Leesville business firms awarded prizes to the contest winners.

The tour and contest at the Forest Festival was repeated in September 1961, with high interest and participation. The high-scoring boy from each school again received an award from the district.

The tours and contests both years were conducted by Soil Conservation Service technicians assisting the district. Teachers and boys alike are interested in the program. Grades on the contests have improved each time, indicating that steady progress is being made. Some of the teachers are incorporating this work into their regular class instruction.

The district plans to continue it's work with the FFA Chapters. The objective is to make soil and water conservation a tradition with today's youth who will be operating the land tomorrow.

H. H. Krusekopf, professor emeritus of soils, University of Missouri, reports too much wet weather has a harmful effect on cropland soils. Air is excluded and oxidation of the minerals is reduced, plant nutrients are not released and may be lost by leaching, soil aggregates are destroyed and soils become compact and crusty, and there is less response to fertilizer, although fertilization may be the most effective way to treat the land.



FFA boys, teachers, and others listen as SCS range conservationist discusses grass and timber conservation.

Truck Crop-Berry Farm Turns To Grass

By Austin B. Summers and Olin M. Thorud



Laying tile in lateral lines 40 feet apart.

M. D. McGregor has demonstrated on his 40-acre farm near Gresham, Oreg., what can be expected from good pastures on sloping lands that are subject to soil erosion when truck crops and berries are grown on them.

Twenty-one and a half acres of this farm, operated according to a conservation plan worked out through the Multnomah Soil Conservation District, furnished 11,340 cow-days of pasture in 7 months in 1961 for 50 head of polled Hereford cattle and 4 horses, plus 42 tons of grass-legume hay not needed for pasturing. These results are in contrast to the local average of 2 tons of hay an acre, or the pasturing of 1½ head of cattle to the acre.

This year, he is pasturing 55 cattle and 2 horses on 29 acres of New Zealand white clover and Akaroa orchardgrass seeded in alternate rows, including 6½ acres planted in 1961, and estimated a third more hay than last year.

Note:—The authors are, respectively, work unit conservationist, Boring, Oreg., and Soil conservation aid, Gresham, Oreg., both of the Soil Conservation Service.

The farm is rolling land with slopes varying from 4 to 29 percent, and with topsoil 20 to 36 inches deep.

When McGregor bought the place, it had been used principally as a truck crop and berry farm. His plan from the start was to use it for hay and pasture for a small herd of beef cattle. The real-estate man suggested that he contact the soil conservation district, and in the summer of 1958 Soil Conservation Service technicians from the district helped him develop his conservation farm plan. Ten acres of steeper land had been retired from truck crops in 1955 and were in grass, and another 2-acre field had been planted to clover in the fall of 1957.

Under the district plan, a conservation cropping system was worked out calling for one year in grain as a clean-up crop, to be followed by a winter cover crop for soil protection. The grain is plowed down

for green manure the next April, preliminary to 1 year of new seeding and 5 years' use for hay and pasture. During the planning stage, McGregor and an SCS technician looked at different pasture mixtures in the district and chose a mixture of Akaroa orchardgrass and New Zealand white clover seen in trial plantings of alternate-row seedings.

Approximately 6,000 feet of tile was installed on two wet fields in April 1959. The tile was laid on the contour, 4 feet deep, with laterals spaced 40 feet apart. Tiling on the contour was needed to cut off seeps and lower the water table for optimum root growth, and to permit pasturing earlier in the spring.

In June, McGregor planted 3 fields to an alternate-row seeding of 3 pounds of New Zealand white clover and 8 pounds of Akaroa orchardgrass. An old grain drill was adapted for the alternate-row



McGregor's lateral 4-inch-tile lines set to grade 4 feet deep on the contour of 15-percent slope.



Year-old alternate-row seeding of Akaroa orchardgrass and New Zealand white clover on M. D. McGregor farm.

seeding, by putting plywood dividers in the box, with every other compartment marked for the

legume seed. Enough inoculated clover seed for 3 acres was mixed at a time, or 9 pounds with 27 pounds

of rice hulls as a dilutant, and 24 pounds of Akaroa orchardgrass in 21 pounds of rice hulls.

The drill was set for planting barley at the rate of 160 pounds per acre. This put approximately 55 orchardgrass seeds and 40 to 45 New Zealand white clover seeds per lineal foot, in alternate rows. The drill was set to plant as shallow as possible, or not more than $\frac{1}{2}$ to $\frac{3}{4}$ inch deep. After planting, the fields were rolled again with a cultipacker.

During the summer of 1959, the fields were clipped to keep weed growth down, and pastured lightly in the fall. In August, 300 pounds of 20-percent superphosphate an acre was applied by spreader, and in March 1960, 200 pounds of ammonium phosphate (16-20-0) to the acre was applied to all pastures.

Another $9\frac{1}{2}$ -acre field was planted to the same grass-legume mixture in the spring of 1960.

Japanese Conservation Success Story

By Eldon Wrenn

HOW is it possible to build a farm out of salt-saturated land where the water table is so near the surface that horses mire down and die?

No one knows better than Kiyoshi and Roy Yamashita, who farm in the Moapa Valley in southern Nevada. Their proof is a vegetable farm on which about \$30,000 worth of produce a year is being grown as compared to only \$3,000 worth a few years ago. The Yamashita boys' grandfather on their Mother's side, first went to Brazil from Japan. He came to the United States in the early 1900's, traveling overland by burro and working en route. It took him $1\frac{1}{2}$ years to make the trip from Brazil to California. About 1913,

he sent for his son-in-law (Kiyoshi's and Roy's father) to come from Japan to help him farm in California.

Their father settled in the Moapa Valley in 1925 on what is now called "the Murphy place." Kiyoshi was the fourth child in a family of 12. Roy is next to the youngest.

With such a large family, the father had just managed to get started in farming when the 1929 depression hit with full force. The farm, which included about 35 acres of fairly good land, was lost.

"Had the financial and technical help available to farmers now been there for my dad's use, I think he could have saved the farm," Kiyoshi says.

The elder Yamashita then leased a 40-acre piece of land in what was commonly called "alkali flat." No

one else wanted this land, for it was a dense entanglement of mesquite, quail brush, and tules. The water table on most of the land was right at the surface. The land was his to do what he could to make it produce.

Money was almost nonexistent with Yamashita, so a hand-grubbing operation was started, with all able members of the family helping. The first year, about 5 acres near Muddy River channel was grubbed and planted to melons. This land was chosen because the water table was lower. Each year a little more land was developed. The Yamashitas worked back up the land from the river, until about 40 acres had been hand grubbed. Meanwhile another 17 acres had been leased.

The Yamashitas signed a cooperative agreement with the Moapa

Note:—The author is soil conservationist, Soil Conservation Service, Reno, Nev.

Soil Conservation District in 1943. A conservation program was worked out, which included: Maintenance of fertility by application of barnyard manure and plowing under green manure crops, application of commercial fertilizers, crop rotations, clearing of additional land, leveling for more efficient use of water and labor, flood-channel realignment, dike construction along the stream-banks, waste ditch construction, and drainage and alkali removal.

"We have followed this conservation farm plan to the letter," the Yamashitas pointed out. "The only thing in the plan that we didn't do was to install concrete pipe drains. Instead, we dug open drains. We called upon the Soil Conservation Service for surveys to help us carry out the program, especially in the construction end. The costlier jobs were done with cost sharing from the Agricultural Conservation Program. It is doubtful if we could have done it alone."

The Yamashitas credit the drains, good crop rotations, and leveling as being the key factors in the reclamation of this land so highly saturated with salts and having such a high water table.



The Yamashitas preparing field for fall vegetables. (l. to r.): Kiyoshi, Roy, and T. Yamashita.



Kiyoshi standing in alfalfa field at spot where water table once was so high that horses became hopelessly mired down.

The Yamashita farm now is bordered by two drains the entire length from road to river channel, and the entire farm has been leveled to grade. Not much land in the immediate area is producing such good crops of alfalfa hay and vegetables; and adjacent land without benefit of adequate drains has been abandoned to mesquite and quail brush.

Even with intensive conservation farming, the limited acreage that the Yamashitas had would not support two families and a parent, after expenses. Then the Yamashitas got a chance to lease a neighboring farm. No back-breaking labor was involved here, because the farm was well developed. There was a natural spot for an irrigation reservoir and a layout of fields that lent themselves to good use of waste water.

The Yamashitas leased for 2 years and then, with a loan from the Farmers Home Administration, bought the farm in 1959. Soil Conservation Service technicians found the diversion ditch and reservoir feasible, and they were built in 1959-60. In 1960 Kiyoshi and Roy split their operations, with Kiyoshi taking over

the later purchased land and buildings and Roy, the younger brother, remaining on the home place.

Kiyoshi hasn't been so busy working for himself that he has neglected to serve his community or his country. Because of his ability to speak the Japanese language, he served as an interpreter in the Army of Occupation in Japan. He is presently serving on the board of supervisors of the Moapa Soil Conservation District. He and Roy support wholeheartedly other community functions.

Have You Seen? ---

• "Outdoor Recreation in Small Watershed Projects," by SCS, released as USDA's PA-500. As explained in this leaflet, small watershed projects offer an excellent opportunity for the development of water-based recreational facilities, with the additional costs to be shared by sponsoring local governments and the Federal Government, amounting to only a fraction of the total cost of such multiple-purpose projects.

OLD PLANT PLAYS NEW ROLE

By A. D. Williamson and E. R. Simmons

SERICEA lespedeza again has proved its ability to do a tough job—stabilization of floodwater-retarding structures in Virginia.

This is a relatively new problem in stabilization, and imposes rather stern demands on the vegetation used. It requires vegetation that is easily established, quick starting, long lived, and easily and inexpensively maintained. It does not need to be highly palatable forage.

Quick-starting is the only characteristic rated minus for sericea, which has poor seedling vigor; but it has been found in stabilizing structures in the South River subwatershed of the Potomac River that there are ways to overcome the slow start of sericea and thus build considerable permanence into vegetative cover. This is done by use of tall fescue and sericea, either by seeding together or overseeding the fescue with sericea.

The first structure in the Po-

tomac was completed and seeded in the fall of 1954. A total of 55 pounds of tall fescue and 10 pounds of sweetclover to the acre was seeded. Two tons of lime and 1,000 pounds of 5-10-10 fertilizer an acre were applied before seeding. The same seeding practice was followed on two additional structures in 1956.

Frequent observations revealed that the fescue provided excellent cover for about 2 years. It remained vigorous, even to the point of lodging; but little was seen of the legume. About the third year the fescue began losing vigor and color. The stand began to thin out.

In 1956, the first structure was successfully overseeded with 25 pounds of scarified sericea seed to the acre. The sericea not only germinated and survived in the voids but produced dense stands wherever it had room to grow. On other structures, too, as soon as the fescue began to lose vigor, the



Sericea lespedeza 3 years after overseeding in Ky. 31 tall fescue.

sericea began to fill in and take over. Even though the original seeding of sericea produced only a limited stand, the few vigorous, mature plants produced an abundance of seed, which in turn seeded voids as they developed.

Tall fescue still is depended upon to give quick cover in the original seeding. Since 1957, sericea with the fescue has been incorporated as standard seeding practice. Today, 9 of the 11 floodwater-retarding structures in the Potomac subwatershed have good stands of sericea lespedeza obtained by overseeding it in established stands of fescue. The other two are maintained in grass cover.

With little or no maintenance treatment, it provides satisfactory vegetative cover for floodwater-retarding structures and other critical areas. Once established, this combination can be managed in two ways: (1) By not mowing or fertilizing, the sericea will tend to dominate the site; and the fescue will tend to be suppressed. (2) Mowing at least once a year, preferably in July, and fertilizing with a complete fertilizer high in nitrogen, give the fescue a better chance,



Sericea lespedeza (dark plants) in time will take over the tall fescue grass on this watershed dam.

Note:—The authors are, respectively, State soil conservationist, Richmond, Va., and soil conservationist, Staunton, Va., both of the Soil Conservation Service.

and the mixutre tends to be balanced with fescue and sericea.

Although other vegetative com-

binations are possible, it is believed that the fescue-and-sericea combination provides the longest lasting

and lowest cost vegetative cover for floodwater structures and other critical areas.

Family and Neighbors

Enjoy Farm Pond

By Waldo H. Rodene

ORVILLE NOBBE near Allen in northeastern Nebraska decided to develop a wooded spring area for protection and winter feeding of his livestock.

When he was through, he had not only the feeding and protection area, but a farm pond, picnic and family and neighborhood recreation site, and a wildlife area thrown into the bargain.

"I had in mind a dam in this area in connection with wildlife and stock protection since the day I put in my first terraces," Nobbe recalls. "I needed a stable water supply and protection from erosion. I hated to see that good spring water going to waste."

He went to see the Soil Conservation Service men assigned to the Dixon County Soil Conservation

District. That's when the fish and wildlife developments and the area for picnics for the family and neighbors were added to the project.



Livestock watering tank outside fenced pond.

The watershed contributing to the pond is primarily of wooded pasture, with a small cultivated area under complete conservation treatment. Because the wooded pasture provided little grazing, SCS technicians recommended that it be protected from livestock and used for wildlife. Nobbe fenced the pond and picnic area to protect it from livestock, which get water below the dam from a trough supplied by a syphon tube.

In building the pond, the contractors cut a steep slope along the shoreline to discourage water weeds. Nobbe next fenced a shallow



Nobbe family enjoying a picnic at their pond.

area to provide swimming for his children. The dam, emergency spillway, and waterline are seeded to brome and Reed canarygrass. To speed up establishment of Reed canarygrass around the shoreline, Nobbe sprigged freshly cut grass.

The pond is stocked with bass and bluegills, through cooperation of the Nebraska Game Forestation and Parks Commission and the Bureau of Sports Fisheries and Wildlife.

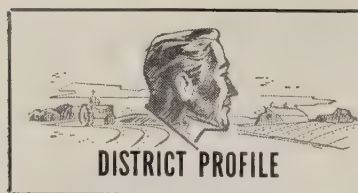
The Nobbe family, including four daughters, has had immense enjoyment out of the new area, along with neighbors and friends, and is looking forward to many more years of fun ahead from this practical water facility designed primarily to meet livestock needs.

When President Lincoln by a stroke of his pen signed the act, May 15, 1862, creating the Department of Agriculture, 1 American farmworker was producing enough food and fiber for 5 people. But when President Kennedy proclaimed the Centennial Year of USDA 1 farmer was growing enough food and fiber for 26 people.



Nobbe sprigging in Reeds canarygrass to control shoreline erosion.

Note:—The author is work unit conservationist, Soil Conservation Service, Auburn, Nebr.



Ezra Briggs—

Gophers Started Him Out

WHEN a Civilian Conservation Corps camp was set up near Sebastopol back in 1935 California Rancher Ezra Briggs was more interested in getting rid of gophers than in erosion control. The rodents had riddled his land with burrows.

One morning, after a night of heavy rain, he found that two streams, fed by gopher runways, came together and gouged out a gully 10 feet deep and 100 feet long in his corral. He appealed to the Soil Conservation Service, which had the CCC boys construct a concrete-lined channel for permanent protection, while Briggs got after the gophers. The lined ditch is still functioning, and there has been no further erosion.

This personal experience directed his attention to the need for erosion control and conservation land management in the community. In order to cooperate with the CCC project more effectively, the

farmers organized a Soil Erosion Association, which guided their conservation work much as soil conservation district boards do today. Ezra Briggs, having a strong "help-your-neighbor" philosophy, was made president.

When the CCC camp closed in 1941, the Association leaders organized the Gold Ridge Soil Conservation District with Briggs as its president. He is still president after 21 years, during which time the district has grown from 99,000 acres to 134,000 acres, with more than 1,200 farmers out of its approximately 2,000 operating units having basic conservation farm plans.

In addition to carrying on an active program of getting conservation on the land, Briggs and his fellow directors have been education-conscious. Through the influence of the district, essay contests and field tours are held annually. Classroom lectures on re-

source conservation are mandatory for biology students in the local Union High School.

Ezra Briggs is a quiet, unassuming man, but he is both patient and persistent in his efforts to spread the gospel and the practice of soil conservation. His effectiveness is evidenced by his various activities.

He is chairman of the resolutions committee and a past area director of the California Association of Conservation Districts; chairman of the Santa Rosa Milk Producers Association; a director and executive committee member of the County Farm Bureau; board chairman of the Sebastopol Cooperative Apple Cannery; and a director of the Sonoma-Marin Dairymen's Association and of the American Dairy Association.

He also is active in 4-H Club and FFA group work. He is a member of the Rotary Club, and the Grange.

But with all these activities, Briggs' primary interest is natural resource conservation. He is manager of a 252-acre ranch, which is a combination of apple orchards and permanent pasture.

Last year, his fellow conservation district board members presented him with a plaque in appreciation of his long service to the community. It was estimated he had given more than a full year of working man-hours to the organization. In acknowledging the honor, it was typical of him to ignore his own contributions and to comment: "Farmers don't want to see their soil washed away, and we are going to continue to help them." Helping people is second nature with Ezra Briggs.



Vice-president W. K. Heathorne presents President Briggs with gift marking 20 years' work with Gold Ridge SCD as Mrs. Briggs looks on.

—FRED W. HERBERT

KNEE-DEEP IN TREES

By Howard M. Hughes

MEMBERS of the Future Farmers of America chapter in the Trego Community High School at Wakeeney, Kans., are knee-deep in trees.

The chapter buys bare-rooted cedars and pines each spring, pots them, cares for them, and sells them the following spring to conservation farmers and ranchers. And a thousand seedling conifers make a sizable knee-high "forest."

The project adds up to a needed service for cooperators with the Trego County Soil Conservation District. Income from the project finances assorted chapter activities.

After a year in pots, the tiny trees have a stronger root system. When they are planted in windbreaks or shelterbelts called for in farmers' soil conservation plans, more of them live and grow. There is not so much replacement, which is both expensive and time-consuming.

Loren Detwiler, vocational agriculture instructor, points out that

the project has been going on since 1957. It began when William Crawford, Soil Conservation Service work unit conservationist, suggested it would be a help to the district program if the seedlings for windbreaks could grow for a year in pots. In that 21-inch average rainfall area, starting young trees is never a sure thing. The FAA members started with 250 trees that first year. This last spring they potted 1,000.

The trees are only 9 to 12 inches high when the chapter buys them through the State Extension Forester at Kansas State University. The seedlings go into tar paper pots filled with good soil. The trees grow only about 4 inches in a year, but Crawford and Detwiler point out the advantage is in giving the root system of a young tree time to develop. This is a key to successful survival. They report that potted stock has 90 percent survival even in the driest years, as compared to only about 50 percent survival for bare-rooted stock.

Note:—The author is area conservationist, Soil Conservation Service, Hays, Kans.



Vo-Ag boys planting seedlings.

Social Note

It probably will be quite a while before another Western Snow Conference ends on a nuptial note as the one did in Wyoming in 1962.

The groom was Author John E. Priest of "Snow Surveys in West Pakistan" in the August issue of **SOIL CONSERVATION**. The bride was Pamela Barnett of Pakistan, whom Priest met in London, where she was a secretary.

The "conservation wedding" came about because Priest, representative of a Chicago engineering firm assigned to Lahore, West Pakistan, and Miss Barnett could not delay in London for the required marriage license waiting period. The 3-day snow conference at Cheyenne, which he was planning to attend before returning to Lahore, provided the first opportunity to obtain a license; so they flew to the United States, proceeded to Cheyenne, attended the conference, and, with snow surveyors and other well-wishers in attendance, were married at the First Baptist Church immediately after adjournment of the meeting.

R. A. Work, head of the Soil Conservation Service's water supply forecast unit at Portland, Oreg., was best man; Homer J. Stockwell of the same office gave the bride away; and Mrs. George W. Peak, wife of the SCS snow survey supervisor for Wyoming, was matron of honor.

The newlyweds now are safely back in Pakistan!



Lawrence Waldschmidt of Trego County SCD and daughter in new windbreak planting on 1,200-acre ranch.

Ohio Eagle Scout Wins

High Conservation Award

By Robert Mills

YEOMAN'S service in behalf of the conservation of soil and water and related resources has added the Boy Scouts of America's coveted Hornaday Award to the honors earned by recently graduated Michael L. Wilson of the Bucyrus (Ohio) High School.

The award, the highest Scouting recognition in conservation, was conferred upon Eagle Scout Wilson of Troop 41 at a recent Court of Honor in Bucyrus.

The award program was instituted in 1920 in honor of the late William T. Hornaday, a pioneer in inspiring public recognition of the importance of conservation. The award is made by the National Council of the Boy Scouts of America, in cooperation with the New York Zoological Society. It is given for distinguished service in conservation, and consists of an engraved medal and attaching ribbon. Only about 12 Scouts each year meet the high standard of accomplishment.

Mike, son of Glenn and Mrs. Wilson of Bucyrus, started out 9 years ago as a Cub Scout. In his advance through the ranks to Eagle Scout, he became a brotherhood member, scouting Order of the Arrow, and earned the God and Country award.

Mike credits veteran Scoutmaster Joe Cotner, who formerly served Troop 41, with helping to inspire his interest in conservation. He took part with his troop in several "Boy Scout Forestry Days" which Cotner arranged at the County Home Farm in 1956 and at the

LaVern Eichhorn farm in 1957, before he formally entered the



Mike Wilson.

Hornaday program that year. Albert Mascari, former district Scout executive, gave Mike guidance and arranged for a Soil Conservation Service technician to serve as his counselor.

In 1958, Mike participated with his troop and members of Troop 63 of Chatfield in a wildlife management field day at the Orville Schwemley farm, in which 1,500 wildlife trees and shrubs were planted around a newly built conservation farm pond. Later that year, Mike was active in a troop pond-mulching project and wildlife tour. By his regular participation,

and by the instruction he gave to the younger Scouts, Mike helped Cotner make the field days a success.

In the Hornaday program Mike has given numerous illustrated talks to school, scouting, and soil conservation district groups. He prepared or helped build numerous exhibits for display in business windows and at the county fair, including a conservation entry in the school science fair that was rated superior.

In 1960, Mike was presented a plaque "For Outstanding Service in Conservation" by the board of supervisors of The Divide Soil Conservation District. His parents became cooperators with the district, and have installed a complete conservation plan on their specialized truck farm.

The young Hornaday Award winner also has taken part in radio broadcasts and written an article on Scout conservation activities for the Ohio Conservation Bulletin. As high school senior, he also found time to serve as editor-in-chief and vice-president of the School's Annual.



Dr. Reuben G. Gustavson of the University of Arizona in delivering the Colorado State University commencement address in June said: "To deny a person the opportunity to develop his mind to the maximum is the greatest tyranny which man has ever imposed upon his fellow man." He emphasized the vital need for education in today's fast-paced world and praised the 100-year old Land-Grant College system.

Note:—The author is work unit conservationist, Soil Conservation Service, Bucyrus, Ohio.



**AFTER A HUNDRED YEARS:
The Yearbook of Agriculture.**
704 pp. Illus. 1962. Washing-
ton, D. C.: U. S. Government
Printing Office, \$3.

For the person who wants to reflect on the history of agriculture in this country, the 1962 Yearbook of the U. S. Department of Agriculture is a "must". The story of American agriculture is indeed a story of America, and this 63d book to be printed since these annual publications were first called "yearbooks" in 1894 lays it out simply but dramatically.

There can be no doubt that agriculture laid the foundation on which this country was built—the foundation from which industry rose to become a world leader. This book, in 704 pages with 706 outstanding photographs, unfolds the story of the early struggles of the pioneer farmer who looked out on half a continent opened up by the Homestead Act of 1862. It sheds light on the revolution that took place between the hardships and privations of these pioneer farmers and the young farmer of today with the wealth of advantages enjoyed by no other people.

It relates how the breeding of plants and animals, control of insects and diseases, conservation of soil, water, and forests, improving of markets, domestic and foreign, and development of agricultural technology in general were accomplished through the growth of the Land-Grant Colleges and the Department of Agriculture, combined with a farm population ever alert to new ways to do its job.

There's a glimpse of the heart-break of the '30s and the technical revolution that followed to make the American man of the soil the most efficient farmer on

earth. And the reader of this book sees how the farmer and the city man have been drawn closer together.

Of special interest to conservationists is the story of the menace of erosion; how the Nation's farmers organized to fight soil and water loss through a new local organization called the soil conservation district; the development of the small watershed program; and the soil survey that started in 1899.

One thing is certain—productive soil will remain the basis of an efficient agriculture and a prosperous economy. A look toward the future indicates that the care of our soil and water will be as important tomorrow as it is today. While an organized approach to soil conservation started late in the last hundred years, conservation is an important part of the revolution in agriculture.

This Yearbook certainly will take its place alongside the others in this series as an outstanding contribution to American agricultural history.

—ALBERT B. FOSTER

**COMPARISONS IN RESOURCE
MANAGEMENT AND THEIR
POSSIBLE U. S. APPLICATION.**
Edited by Henry Jarrett.
271 pp. 1961. Johns Hopkins
Press, Baltimore, for Resources
for the Future, Inc. \$4.50.

The 18 essays in this book were presented originally as public lectures in the Forum on Comparative Resources Policy and Administration, held during the spring of 1961 by Resources for the Future, Inc. For each subject, one essay explains the nature of the problem in the United States; the second explains what another country is doing about it; the third considers what the United States can learn from the experience of the foreign country. The subjects, and the foreign countries offering experience, are:

National parks administration:
England and Wales—Small Forest

holdings: Sweden — Preservation of natural areas: Great Britain—Water pollution abatement: West Germany — Local integration of programs: Ontario, Canada—Development of a region: France.

The essayists (lecturers) are all men of well-known reputation. The lengthy list includes such authorities as Conrad Wirth, Richard McArdle, Donald A. Williams, E. M. Nicholson, Stanley Cain, Edward H. Graham, Ayers Brinser, and John Nixon.

Material offered in the essays is rich, and will well repay reading by any professional man in the natural resources field. Very little is said about either scientific or technological methods, or about techniques of administration, as the editor notes. As he also says, "The resources problems that cause the most trouble almost always have strong social and institutional elements requiring public agreement on goals and public choices among alternative lines of action." Hence, in these essays, the reader will find greatest emphasis "on the social values involved in defining resource problems, establishing general objectives, and organizing programs to attain them."

This is well done work worth thoughtful consideration by all conservationists hopeful of improvement in the present programs of the United States.

—WILLIAM R. VAN DERSAL



The Rutgers University soils department found dairy pasture and hayfields that could take almost 5 inches of rain an hour, compared to the slowest intake of 0.3 inch an hour on a potato farm, and 0.5 inch on a vegetable farm. Most irrigation equipment is designed to deliver 1 inch of water an hour, but the Rutgers test showed that only one-third of the farms visited were capable of using that amount.

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Multiple Use: A Concept for Private Land

"We stand, in a very real sense, on a New Frontier in conservation through applying more broadly the concept of multiple use to private lands. We have the unique opportunity to bring together two problems of great concern to this Nation—an abundance of food and a shortage of recreation—and to find that in solving one we also can solve the other. It is an old, yet new, principle of conservation.

"We can balance the productivity of our farmland with the ability of this Nation to use food and fiber effectively and efficiently by applying more fully our land and water resources in sound conservation programs to meet the growing non-farm demands on land and water made by an increasingly urban and metropolitan nation.

"Much attention has been devoted in recent years to the multiple use concept on public lands. The Department, for example, has long managed the National Forests not only for timber, but also for

recreation, wildlife, forage, and water.

"And now the agricultural program which the President has proposed to the Congress this year brings together for the first time the concept of balanced agriculture, conservation and the urban needs to use land and water for a multiplicity of purposes.

"There have been tremendous advances already in the development of conservation programs on private land and its waters, forests, grass, and wildlife.

"Yet, with all the progress, today's great need for conservation is on privately owned land. Here lies our greatest opportunity to achieve the multiple benefits of conservation for every American now and in the future.

"Idleness is not, and must never become, a part either of conservation policy or of agricultural policy. Land and its renewable resources are for use—for use by people. We guard, we conserve,

we renew, and we develop resources. But we also use them.

"Every extra acre of cropland can be put to productive, economic use—for pasture and range, for timber, for fish and game and other wild creatures, for water conservation and supply, and for outdoor recreation.

"We believe we are embarked on programs to cope with the revolutionary forces of science and technology in rural America—programs that also will meet the changing needs of all Americans in an expanding national economy.

"The goals are as important as food, raiment, shelter, pure water, fresh air, green spaces, and the eternal eloquence of Nature and her wild creatures.

"We are fortunate to have the resources, the technology, the experience, the foresight, and the will to achieve these goals."

(Excerpts from address by Secretary of Agriculture Orville L. Freeman at White House Conference on Conservation at Washington, D. C., May 24, 1962.)

Have You Seen?---

● "Stabilizing Sand Dunes on the Pacific Coast, With Woody Plants," by Robert L. Brown and

A. L. Hafenrichter of the Soil Conservation Service, released by the U. S. Department of Agriculture as Miscellaneous Publication 892. Major uses of woody plants in dune stabilization are given in this bulletin. In planning for the

use of woody plants, shrubs for intermediate and auxilliary stabilization and trees for semipermanent and permanent stabilization are discussed, as well as the culture and management of woody plantings.

OCTOBER 1962

Soil Conservation



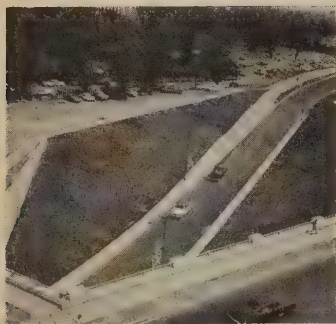


Growth Through Agricultural Progress

Soil Conservation 25 Years Ago

"In the Soil Conservation Service program, a proper water distribution system with a minimum of 'waste' water is surveyed by the engineers and constructed by the cooperator. This compares with the installation of contour-tillage practices on farms dependent on precipitation for crop production in other projects . . .

"The prevention of 'sloughing off' of banks along drainageways has not yet been satisfactorily solved, and cannot be solved except by reducing the volume of the waste water which causes the gullies. Only conservative use of water will avoid the distressing damage caused by the surplus turned loose to seek a course to the sea. The irrigationist must learn the fundamental truth, that he is dealing with a destructive as well as a life-giving agent. It is possible to gage more correctly the amount of water required and thus prevent the accumulation of a surplus to destroy the neighboring landscape."



COVER PICTURE — (See page 59.)—Photo by Richard Evans.

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Soil Conservation

ORVILLE L. FREEMAN
Secretary of Agriculture

DONALD A. WILLIAMS
Administrator, Soil Conservation Service

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FRANK B. HARPER, Editor

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Federal and State Road Agencies Battle Erosion

By Robert T. Walker

THE extent and importance of control of roadside erosion will be appreciated when it is realized that there are more than 866,000 miles of both rural and urban highways in the Federal-aid primary, secondary, and interstate highway systems. For example, on roadside areas of the 41,000 mile National System of Interstate and Defense Highways, it is anticipated that cost of soil stabilization by proper grading, drainage, and erosion-control methods, including special structures and materials, may approximate one-half billion dollars.

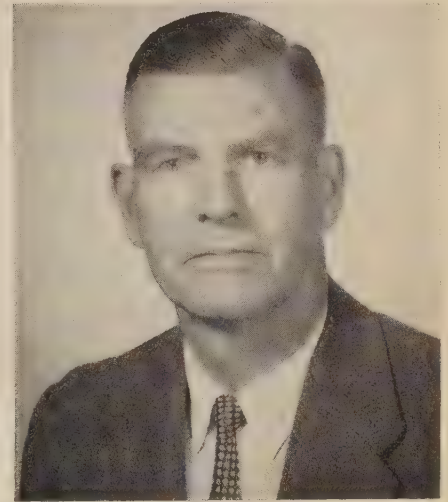
Under Federal-aid legislation, the States have the initiative in proposing roads to be improved and the type of improvement. The States prepare surveys, plans and specifications, let contracts, and supervise construction, subject to Public Roads approval.

The importance of protecting raw

earth slopes against erosion has long been recognized by highway administrators. The extensiveness of soil stabilization on highway cuts and fills is difficult to estimate on a nationwide basis, because of wide variations in soils, topography and climate.

As early as 1933, the Bureau of Public Roads encouraged each State highway department to include roadside improvement work in its program of construction on the Federal-aid highway system. This work included elimination of construction scars, flattening and rounding of slopes, seeding and sodding, and related roadside improvements. Regulations provided that a minimum of 1 percent of the total amount allotted to each State be expended for roadside improvement work. Prior to World War II, all demonstration work for control of erosion and improvement of roadsides was carried out as a separate operation after a highway was built.

In 1936, cooperative demonstra-



Robert T. Walker.

tions for the study of soil erosion along highways were initiated by the Bureau of Public Roads in cooperation with the Soil Conservation Service. The object of these cooperative demonstrations was to study methods and demonstrate practices, materials, structures, and plants best adapted for the prevention of erosion along highways under varying conditions of cross section, soil type, and climate, taking into consideration relative initial cost and subsequent maintenance. More than 70 cooperative soil erosion control projects were completed in over 20 States.

Such demonstration work was discontinued during the emergency period of World War II (1941-45), because of shortages in manpower, money, and materials; but, as a result of wartime conditions, erosion-control work was included as an integral part of construction in the grading and drainage of wartime access roads. Following World War II, Public Roads encouraged



Cut and fill slopes well-rounded and protected against erosion on this interstate controlled access highway west of Ridgeville, Md.

Note:—The author is landscape architect, U. S. Bureau of Public Roads, Washington, D. C.

the States to provide roadside improvement work as a part of original construction on Federal-aid projects, including:

Conservation and protection of natural landscape features, including trees, strips of woodland, springs, shorelines, and sites for wayside development. Salvage of topsoil, sod, stone, and other local material warranted for use on the project. Grading and shaping of slope and drainage areas and protecting them against erosion by such measures as warping and rounding of earth cuts and fills, adequate drainage, and protection of all areas disturbed by grading. This is done by topsoiling, seeding, sodding, mulching, ground cover and vine planting, riprapping of slopes; by turfing, paving, or other suitable surfacing on areas subject to erosion; and by providing vegetative or other protection.

On January 25, 1961, the American Association of State Highway Officials adopted and published "A Policy on Landscape Development for the National System of Interstate and Defense Highways." This policy emphasizes slope grading, drainage, and erosion control as closely related operations, and also the need for their consideration together in the design and construction of highways. Where unstable soil and slope conditions are es-

pecially critical, soil erosion on roadside areas, unless properly controlled, may create the movement of large earth masses such as landslides and threaten the safety and usefulness of the highway. Some projects may require special under-drainage and costly piping.

State highway department plans and specifications for Federal-aid projects provide for the conservation and protection of natural features where feasible. Native materials such as topsoil are salvaged and stockpiled for reuse. Most States require that available topsoil be disked or harrowed into cut slopes where conditions permit, to provide a favorable medium for planting.

Vegetative cover on highway cut and fill slopes is recognized generally as the most practical method of stabilizing soils and reducing erosion in climates favorable to plant growth, either by seeding or other vegetative methods. As a rule, Federal-aid highway construction contracts provide that seeding and mulching operations be performed as soon as possible after grading of slopes has been completed. However, structural methods such as cribbing, retaining walls, and riprapping may be justified where the use of vegetation would not be practical.

Modern equipment for tilling,



Machine spraying seed and fertilizer on roadside in West Virginia.

soil preparation, seeding, and mulching provides the contractor with economical methods of establishing grass cover on roadside areas. The improvement of many State standard specifications in recent years provides the contractor with alternate methods of applying soil amendments, fertilizers, rates and mixtures of seed, and rates and variety of mulch and tie-down materials.

Where slope ratios are steep and equipment such as seed drills and fertilizer spreaders cannot operate effectively, spray types of equipment are used to distribute a mixture of seed and fertilizer in water. There is increasing interest in air-blast equipment and the use of helicopters or light planes for seeding operations in large scale or on difficult terrain.

Cooperative efforts by various governmental agencies working with people in research and industry have made significant contributions in materials and methods toward controlling roadside soil erosion. Resulting new materials include wood pulp fiber, elastomeric polymer emulsions, jute mesh, paper fabric, glass fiber blankets, and a felt type blanket impregnated with fertilizer, organic material, insecticide, and specified seed. Some already are proving their value and are comparable costwise to straw or hay mulch.

The highway administrator is interested in successful seeding at the lowest cost. Through such cooperative research and the development and use of new materials and improved equipment, the cost per square yard of erosion control has



Mulch blower spreading straw on fill slope along U.S. 50 near Mitchellville, Md.

been reduced about 75 percent on highway cuts and fills in construction of extensive mileages of Federal-aid projects where modern machine methods are advantageous over hand labor and old types of

equipment.

The Bureau of Public Roads likewise has cooperative agreements with 14 State highway departments for roadside research studies. State universities also are assisting in

investigations of the establishment of vegetation, types and use of equipment, chemical weed control, and roadside maintenance and its effect on highway design and construction.

School Conservation Project

By James S. Bennett

Heals—Beautifies Freeway Eyesore

CLEVELAND is gradually getting a modern expressway system. Workers can live farther out and get there quicker. But probably nowhere in the country has urban sprawl moved in faster and left more scars on the landscape than in this Ohio area.

Bare banks and borrow pits have sprung up where, only a decade ago, cattle grazed on grass-covered slopes. Meanwhile, each year Cleveland dredges nearly a million cubic yards of sediment from its harbor—at a cost of \$500,000.

One 4-acre eyesore, left when Route 21 Freeway was built, lay right along the school ground in suburban Cuyahoga Heights. But, thanks to conservation-minded school officials, motorists on the freeway now see a new landscaped area covered with grass and shrubs. Not only is the old eyesore gone, the school has in its place a brand new outdoor classroom and athletic field.

Conservation planning has begun moving back into suburban Cleveland. Even back in 1940, officials of Cuyahoga Heights School had sponsored tree planting on the school grounds. The trees now serve as an outdoor study area for biology students. But, at the outset, the question was whether this huge mound, with gullies up to 35 feet deep, could possibly be leveled and planted. The project not only would benefit Cuyahoga Heights School, but it would serve

as an example of a well-planned erosion-control project that might help promote other needed conservation reclamation work.

Superintendent Robert C. Ray envisioned still other assets. The smoother part of the grounds, properly seeded, could serve as a practice football field, and possibly as a baseball field. Ray got in touch with the Soil Conservation Service through the Cuyahoga Soil Conservation District.

The soil type shown on the Service's soil survey maps indicated that the area would be difficult to control. Huge gullies bore out this discouraging prospect.

Through efforts of SCS State and area engineers, a water-disposal plan was worked out. It was

significantly different from most such plans. Usually, it is enough for conservation diversions ditches to be seeded to grass; but these diversions would have to be paved with asphaltic concrete! Rather than empty into the customary sod waterway, they had to be emptied into corrugated pipe. Some surface water could be absorbed into the ground by use of good grass cover, but all excess would have to be "walked" off the slope.

The SCS took the suggested plan to Bill Sweeney, village engineer, who agreed to draw up a blueprint and supervise construction. The blueprint would list the kind of seed, fertilizer, and mulch to be

Note:—The author is area conservationist, Soil Conservation Service, Warren, Ohio.



Eroded "eyesore" before land grading and reseeding began.



Seeding Contractor Peter Muller in 35-ft. gully before land grading was done.

used on each individual area.

In 1961, the contract was ready to be let. Several contractors refused to enter a bid, realizing that this was a tremendous project. The rough grading went to an excavating company on a bid of \$20,000, which included filling the gullies and regrading the entire area to a specified contour. The contractor used three large "pans," in addition to bulldozers and compacting equipment, to move 37,000 cubic yards of soil.

The installation of engineering practices, seeding, and mulching

went to a horticultural firm at a cost of \$24,585. This contractor used 120 tons of asphaltic concrete to line two diversion ditches which empty into 180 feet of corrugated steel pipe. He also spread 4 inches of topsoil over the practice football field. The seeding mixture consisted of creeping red and Kentucky 31 tall fescue, Kentucky bluegrass, perennial ryegrass, and sweet-clover. A half ton of seed, 4 tons of fertilizer, and 10 tons of straw mulch were used.

School officials planted trees and shrubs in designated areas, to provide food and cover for insect-eating birds and animals. The entire school grounds will serve as an arboretum where students can study soil, water, and wildlife conservation. The project is a step forward toward a soil and water conservation plan that the school will carry out in cooperation with the Cuyahoga district.

Housing developments, shopping plazas, and new highways around Cleveland are contributing to an ever-increasing problem. Each year more and more urban residents are asking the SCS for help with erosion problems. Much of the agricultural land in the county is well protected. Most of the erosion is



Supt. Ray (r.) and Duane Bosworth of SCS examining one of 8-ft. asphalt diversion ditches.

caused by urbanization activities.

City and county planning commissions, county commissioners, village officials, and schools—all who control unprotected urban land—need to plan proper water-disposal systems for all land developments. This might include water-conservation reservoirs that will hold water for future use. It is becoming more evident that a conservation plan is needed on all land, both urban and rural, if highway and housing construction and related soil and water conservation problems are to be licked.

VIPs FOR ROADSIDE IMPROVEMENT

By Bernhard A. Roth

NO plants at the moment are more important to the Connecticut Highway Department than a few dozen very-special shrubs growing timidly but surely on selected embankments along the Constitution State's interstate highway system. The Department calls them VIPs—"very important plants."

Their slender, woody shoots

groping toward the sun were started directly from seed, rather than from the usual plantings of 15- to 18-inch nursery stock. If the plants thrive, a new era in highway vegetation and maintenance may begin. If they don't, chief mourners will be William C. Greene, landscape engineer for the State Highway Department, and Wilson O. Hill, plant materials specialist for the Soil Conservation Service.

Several years have elapsed since the Connecticut Highway Department and the SCS got together. Their mutual aim has been to select native shrubs and direct-seeding techniques that will be useful on the long miles of road between towns and highway interchanges. Functional plantings from nursery stock will continue to enhance rights-of-way through communities. They will also serve special pur-

Note:—The author is field information specialist, Soil Conservation Service, Upper Darby, Pa.

poses, such as driver-visibility and road-outlining at access points.

In the meantime, a successful, direct shrub-seeding program could chop an immense slice off Connecticut's current road-scaping costs. Greene puts a value of \$1 to \$5 on each woody plant growing by the wayside; and \$12,000 to \$25,000 for each running mile of highroad successfully grassed and shrubbed. Close to 300 miles are embraced in the State's expanding interstate work alone. Fractional savings to the mile would add up to a startling figure.

The Soil Conservation Service has been searching out new plants and planting techniques to protect soil for more than a quarter of a century. The agency's backlog included getting things to grow on such improbable sites as the Dust Bowl, strip-mine spoil, and sand dunes all over the country. Here would be a chance to experience a new twist in revegetation.

Disaster befell an initial fall seeding of trial shrubs. A heavy winter melt-off of snow and ice ripped through the test bankings,

taking most of the seed with it. The next spring and fall, Connecticut highway personnel and SCS technician Hill doggedly repeated their experimental seedings, bearing in mind that germinating and growing most shrubs is a 3- or 4-year undertaking.

On an April morning recently, landscapers and conservationists could utter a few restrained huzzahs. Crawling up and down several test plots while puzzled motorists whizzed by, they singled out first one skinny shoot—then another—and another. They were survivors of the ill-starred wash-out! Thus did two species of rose—*wichura* and *multiflora*—join the elite of Connecticut's "very important plants." They are doing nicely.

Greene and Hill have broadened their trials to include a score of common and native shrubs. Their thought is to have the countryside look as naturally wild and lovely as ever, after the roadbuilders have moved on. Mainly, they are working with species that New Englanders have known in their woods,



Old-fashioned corn planter held by Landscape Engineer Wm. P. Greene of Connecticut Highway Dept. (r.) is one device used to spot-seed shrubs. Wilson O. Hill of SCS (l.).

farmlands, and backyards for centuries. In addition to roses, they are seeding sumacs, shrub, dogwoods, bush honeysuckles, bayberries, bush lespedezas, sweet fern, and viburnums.

Also being checked are several methods of direct seeding. If the plots grow as hoped, shrubs will occupy all areas being stabilized except an 8- to 10-foot grass border next to the pavement. It is hoped that woody vegetation will help reduce the highway mowing bill.

Minnesota and New Jersey highway departments also have in the past few months organized shrub-seeding activities.



Stockwater ponds and erosion control or water-detention structures in many cases can be designed to provide secondary fish and wildlife benefits, without extra cost.



An exposed soil profile, such as the side of an open pit, can be studied for past history and probable future changes in soil of the surrounding area.



Erosion damage caused by runoff water from adjacent areas can be reduced by diversions and detention structures.



Route 15 overpass roadbank near Rockville, Conn., newly direct-seeded with indigenous shrubs expected to supplant other vegetation.

Roadbank Revolution

By Karl E. Graetz and C. H. Jent

COOPERATIVE roadbank stabilization projects have become a familiar sight to motorists on Tennessee's highways and byways from the Mississippi River to the Smokies. Green islands of kudzu, fescue, lovegrass, sericea, and native grasses dot the State's once predominantly bare road cuts.

This roadbank revolution in the Volunteer State is a result of a gradual bending of public opinion developed through conservation teaching. Bare roadbanks always have been taken for granted—a familiar part of the daily scene. Then, about 1957, the seriousness of roadbank erosion and unsightliness began to aggravate the public conscience.

Certainly much of the enthusiasm and initial drive behind the movement was inspired by soil conservation district supervisors and assisting Soil Conservation Service personnel. Most of the early projects were sponsored by the district

supervisors. Groups such as the Garden Clubs, Future Farmers of America, Boy Scouts, and community and civic clubs were eager to make some tangible contribution.

Local highway department people contributed labor. Oftentimes, merchants and farmers donated fertilizer, straw for mulch, and the use of farm equipment. Through the Soil Conservation Service, new plants and techniques were made available for trial.

With guidance supplied by Service technicians, roadbank projects sprang up all over the State. In the 4 years beginning in 1957, plantings had been made in 42 of the 95 soil conservation districts. University of Tennessee agronomists and Service technicians have cooperated in evaluating the results of these plantings.

Some of the new plants tested failed entirely. Others, such as Indian grass, switchgrass, everlasting pea (*Lathyrus latifolia*),

memorial rose (*Rosa wichuraiana*), and honeysuckle met with limited to good success on some sites. The use of tall fescue on roadbanks is limited to the better soil areas and to the main highways where extra management is feasible.

Bermudagrass did well on the deeper soils, especially west of the Tennessee River in the loess area; but it declined on the very poor banks, and fertilizer was needed to keep it going on the majority of sites. Crownvetch was slow to establish in Tennessee. However, after 2 or 3 years, many of the plantings continue to thicken, in the cooler areas.

After 2 years, the Service found that many of the plants under trial decreased or went out entirely. Droughty, infertile soil conditions on the slopes were too severe. Some of the best results were obtained from sericea lespedeza, lovegrass, kudzu, and certain native grasses, although both sericea and the native grasses were difficult to establish from seed when using conventional seeding methods.

In western Tennessee, the State Highway Department had been using hay of native plants mowed through the summer from along rights-of-way to mulch banks. No fertilizer was used, and the hay usually contained little seed. Although establishment of vegetation was slow, this is a practicable and economical practice; and many miles of roadbanks have been treated in this manner.

Soil Conservation Service technicians refined this method, by making selective cuttings of native bluestem hay (Virginia broomsedge, little bluestem, split beard-



McEwen FFA boys examine fescue sod they helped plant on roadbank the fall before.

Note:—The authors are, respectively, plant materials technician, Raleigh, N. C., and agronomist, Knoxville, Tenn., both of the Soil Conservation Service.



Ruritan Club members and others spread mulch on roadbank plot seedings on Highway 109 near Laguardo, Tenn.

grass, etc.) in the fall when the seed was ripe. The hay was applied as a mulch-covering on from 50 to 75 percent of the soil surface. In the spring, 600 to 800 pounds of 6-12-12 fertilizer was broadcast over the mulch, just before expected germination. Full stands resulted.

In order to overcome the difficulty in getting stands of sericea, the hay was mowed when in seed and applied to the back slopes as a mulch. Combine run, or unhulled, seed at 100 pounds an acre, and even hulled unscarified seed at 80 pounds to the acre, also was planted and mulched with grain straw, from the middle of October to mid-January.

Past experience with weeping lovegrass on roadbanks showed that stands thin out and become clumpy with age. However, the ease of establishing this grass and its quick production of summer cover are valuable assets. To take advantage of this trait lovegrass was used in combination with more dependable, but slower growing, plants. Sericea proved to be the best companion. Lovegrass gave quick protection, and as it faded, the sericea plants were released to take over.

Kudzu is a veteran roadbank conservation plant. What it can't grow in, it will grow over. It is particularly valuable on steep banks where seedings are impracticable. Kudzu always has been slow in producing complete cover, but observations confirmed that plants established in the sediment deposit near the ditch line outgrew all the others. As a result, basal plantings of kudzu were started in the spring of 1958 in the White County Soil Conservation District. This method produced dense cover on the lower slopes in 2 years, and this method of planting now is standard. A row of slower growing plants on the top of the bank to provide a few trailing vines for the lower plants to climb on is included.

The State Highway Department has cooperated on all the roadside plantings; and additional funds have been made available for purchasing materials and equipment for establishing vegetation on a large-scale basis. Now, many miles of State highways are being planted each year. Also, several county highway departments have done work toward vegetating road cuts. Several soil conservation districts

have furnished mulch materials for large-scale plantings, enabling the Highway Department to accomplish more with limited funds.

At the request of the Department, the Soil Conservation Service and University of Tennessee agronomists made suggestions for revising its seeding specifications—planting dates, seed mixtures, fertilizer, and mulching rates.

Land and People Conferences

Strengthening and revitalizing rural America through rural areas development and conservation is the theme of five regional conferences on Land and People called by the U. S. Department of Agriculture in September and October. Farmers, businessmen, educators, civic and government leaders were invited to put forward their own proposals for insuring prosperity in their communities.

Secretary Orville L. Freeman named as a major objective of the conferences—an outgrowth of the National Land and People Conference in Washington last January —“to broaden public realization of the interdependence of rural and urban people, and the stake that city people have in the welfare of our rural land resources and the people and institutions that provide our Nation so bountifully with food and fiber.”

The conference schedule:

Sept. 17-18—St. Louis, Mo. (Mich., Wis., Minn., Iowa, Mo., Ill., Ky., Ind., and Ohio).

Oct. 1-2—Portland, Oreg. (Wash., Oreg., Calif., Ariz., Utah, Nev., and Idaho).

Oct. 8-9—Denver, Colo. (N. Dak., S. Dak., Nebr., Kans., Okla., Tex., N. Mex., Colo., Wyo., Mont.)

Oct. 15-16—New Orleans, La. (N. C., Tenn., Ark., La., Miss., Ala., Ga., S. C., Fla.)

Oct. 22-23 — Philadelphia, Pa. (Mass., Maine, Vt., N. H., Conn., R. I., N. Y., N. J., Pa., Del., Md., Va., W. Va.).

Basal Plant Density Guide To Protecting Highways—Other Slopes

By William L. Smith

SPEEDED-UP construction of highways in all parts of the country brings the matter of stabilizing earthen slopes and cuts into sharp focus as a national problem. So, too, does the building of such other conservation structures as flood-prevention dams and reservoirs.

The Soil Conservation Service has been concerned with this problem on the small dams constructed to help prevent floods. In Texas alone, more than 600 small dams have been built since 1954. As a result, rapid progress has been made in the techniques of planting and followup treatment to promote the growth of grass on such sites, though the advancement in management and maintenance knowledge has not been so rapid.

To find out how much grass was

necessary, and how dense the cover should be to give protection—or its most desirable basal density—the Service made a field evaluation. Measurements were made on flood-prevention structures, and on embankments of farm ponds, lakes, and levees that already were vegetated. In each instance, the cover had given excellent protection for several years. The structures chosen met the following requirements:

(1) Soil erosion was controlled, and there was no active gullyng, rilling, or excessive loss of topsoil. (2) There was enough cover (grass and litter) to prevent damage from a heavy rainstorm. (3) All structures selected for the evaluation were properly grazed or mowed, and weeds were controlled.

Desirable adapted plants with

sufficient vigor to endure under proper management were identified for the various areas. A quadrat analysis method was used to determine the percentage of basal density. The top growth and effective litter were clipped and weighed to get a correlation between basal density and pounds of cover.

For the 17- to 19-inch rainfall area, high lime soils over limestone and sandy soils, with an average winter temperature range of 36° to 46°, the grasses furnishing the best protection were side-oats grama, little bluestem, plains bristlegrass, Indian grass, switchgrass, blue grama, Caucasian bluestem, and KR bluestem in the warmer part. A minimum of 14 percent basal density of stands composed of one or more of these grasses yielded a satisfactory cover. The system of management called for no grazing, except as needed for the benefit of the grass.

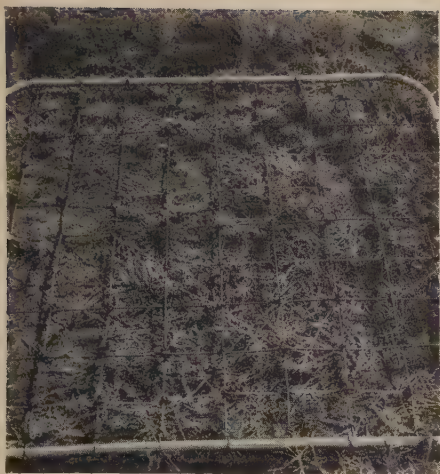
On heavy clay and sandy soils over limestone, shales, and sandstone in the 20- to 30-inch rainfall belt, with an average temperature of 44°, KR bluestem, green sprangletop, plains bristlegrass, side-oats grama, and little bluestem proved best adapted. A minimum of 14 percent basal density of a mixture of three or more of these grasses was sufficient cover.

In a large area of high lime soils in the 25-inch rainfall area with average winter temperature of 61°, good plants for giving soil protection and livestock feed were Medio bluestem, buffelgrass, Kleberg



Buffelgrass on 2:1 slope measured for basal density.

Note:—The author is management agronomist, Soil Conservation Service, Denton, Tex.



Basal density here measured 77 percent.

bluestem, side-oats grama, plains bristlegrass, and four-flower trichloris. A minimum of 18 percent basal density of mixtures of these grasses gave a satisfactory cover.

Bermudagrass, a turf grass, was used in areas of more than 30 inches annual rainfall, with an average winter temperature of 44° to 55°. A minimum of 40 percent basal density of bermudagrass gave a satisfactory cover on embankment slopes and spillways from crest to the outlet end. On forebays, cut slopes, and noncritical areas, a basal density of 30 percent of bermudagrass gave a sufficient cover. Bunch grasses in this rainfall area—such as KR bluestem, switchgrass, side-oats grama, little bluestem, and Texas wintergrass—were used on some sites. A basal density of 20 percent of these grasses gave sufficient protection.

Basal density of adapted desirable grasses seems to be a good criterion for determining when a satisfactory cover of grass is established on slopes requiring a cover of grass for protection against water erosion. As soon as all critical areas of the structure have a minimum percentage of basal density of acceptable grasses, as set forth in the criterion, and erosion is controlled, the cover is considered satisfactorily established.

In addition to the use of basal density as a criterion in the area

of heavy clay soils over limestone and sandy soils over sandstones in the rainfall area of 20 to 25 inches, with an annual mean temperature of 44°, 2,500 pounds air-dry weight of the adapted grasses was approved as an alternate standard for bunch grasses.

For sites on heavy clay soils in the 17- to 19-inch rainfall area with a mean annual temperature of 46°,

nine established plants to the square yard were approved as a satisfactory cover. They included side-oats grama, blue grama, green sprangletop, KR or Caucasian bluestem, cane bluestem, plains bristlegrass, and Texas wintergrass. No consideration was given to low order perennials and annuals, but their presence was expected to increase the effectiveness of the cover.

Erosion Control On D. C. Loop, Too!

Administrator Donald A. Williams sees in a piece of roadside conservation work just across the street from his office in the U. S. Department of Agriculture's "South Building" one more dramatic example of the results of a quarter of a century of encouragement of highway protection by the Soil Conservation Service in cooperation with Federal and State highway agencies.

After fretting for a year or more about the eroding banks of a cut leading into the 12th Street tunnel

under Washington's historic Mall, he and his staff were pleased to see protecting sod laid on the banks as soon as the paving had been finished, and well before this key link in the capital city's new inner-loop beltway was opened to traffic.

Spreading topsoil, fertilizing, and sodding is being extended progressively to the slopes of other underpass and elevated roadway approaches in the Southwest Freeway maze as fast as construction work is completed on different sections. (SEE COVER PHOTO.)



This effective highway conservation work provides pleasing view for SCS people from USDA South Building (l. background). Flags flew opening day.



Donald A. Williams.

ONE of the miracles of 20th Century America has been the long way we have come in road building and maintenance. And it has been a long way to our day of superhighways from that time, a half a century or less ago, when township farmers got together with their teams, scrapers, and drags during good-weather lulls in the cropping season and "worked" the dirt roads.

One of the significant aspects of the evolution of modern highway planning and construction has been the growing attention to roadside erosion control, stabilization, and beautification. For example, when I started out in highway work, no one realized there was such a problem as roadside erosion. Information was not available to road builders on soils or soils mechanics, erosion, and other factors that today are commonly taken into account by highway bodies. That was in 1924 when, fresh out of high school, I carried the chain and ran the rod on roads in northern South Dakota for a brother who had an engineering firm.

The same situation largely pre-

Conservation for Better

By Donald

ailed during my later work as engineer with the South Dakota Highway Department before coming with the Soil Conservation Service in 1935. The State today has one of the outstanding highway conservation programs in the country.

The Service, in seeking to put a stop to roadside as well as farmland erosion, and to resulting costly road maintenance, called the attention of highway builders to some of the techniques of slope protection, water disposal, and other measures that now are in such widespread use. In fact, while I was SCS project engineer at Dayton, Wash., in 1938-39, we launched one of the earlier formal highway pilot erosion control projects in the country, just outside of Walla Walla, in cooperation with the U. S. Bureau of Public Roads and the State Highway Department. We were demonstrating some of the principles later adopted as

standard practice.

The Bureau, which also already had been interesting itself actively in this new aspect of road building, from those early conservation days on gave increased national leadership to the erosion-control program in the Federal aid highway system. It has done a marvelous job.

Through these cooperative Federal-State-local efforts, roadside protection and beautification may be seen today from one end of the country to the other—on interstate turnpikes, State highways, or farm-to-market roads. Although the Soil Conservation Service can, I think, properly take credit for helping to get this important activity started, it is more significant that it is the public roads and State highway people who now are effectively putting the program into practice themselves.

More and more of our technical assistance now is centered on



Protected roadbanks like this one near Ritzville, Wash., stretch for uncounted miles over the country's horizons.

Note:—The author is administrator, Soil Conservation Service, Washington, D. C.

Roads Moves Ahead

Williams

county and township roads, where erosion and water management is a real problem, but where local authorities do not have the facilities that the State and Federal highway agencies have. The Service provides this help through soil conservation districts and through local small-watershed projects, because the problems of roadside and adjacent farmland erosion and dealing with them are interrelated.

The Service also gives technical advice to local planning and other bodies that request counsel on coping with increasingly troublesome highway erosion and water problems in built-up rural areas. Of the Nation's total of 3½ million miles of roads and streets, about 2¾ million miles are other than State or Federal roads.

In any case, watershed protection and flood prevention is of special importance to protection of our roads and highways. Roads and bridges are among the heaviest

casualties when streams flood lowlands or heavy rains wash soil off of adjacent lands onto roads.

Total nonagricultural damage for 361 planned watersheds on which figures are available is nearly \$6½ million a year, a substantial portion of which is to roads and bridges. The land treatment and flood prevention treatment measures employed in watershed conservation are designed to halt or greatly reduce such flooding and sedimentation, and roads benefit accordingly.

In addition, many watershed plans include direct protection of roadside ditches, cuts, fills, and shoulders to protect them from erosion and to prevent sediment from being delivered from roadsides into the watershed channel system to create further sedimentation damage downstream. To July 1, 1961, a total of 4,200 miles of such roadside erosion control had been carried out in watershed and flood



Recreation for all and pleasant stops for travelers are among dividends of highway conservation measures like this roadside pond near Bel Air, Md.

prevention projects alone.

As a representative example, approximately 150 miles of roadside erosion control is being established in the Muddy Creek watershed in McDowell and Burke counties in North Carolina by the State Highway and Public Works Commission with seed, fertilizer, and plants provided from Federal watershed funds. Untreated roadbanks are one of the major sources of sediment in this watershed.

One of the most important, and popular, contributions the SCS makes to highway erosion control programs is the supplying of soil survey information. The Service collects soil samples, as part of its regular surveys, and sends them to the Bureau of Public Roads, which makes engineering tests itself or through 30-some State highway department laboratories. The data are used both by the Bureau and the State highway departments in highway planning and design.

Availability of this information to highway people has saved them untold amounts of money, in such items as determining most suitable road locations from the standpoint of adequacy of subgrade for yielding construction material without more costly "borrowing" and



One way of getting the job done—building structure to prevent sloughing of highway bank on Route 9 near Cummington, Mass., in Berkshire SCD.

hauling by the contractors. O. L. Lund and O. B. Griess of the Nebraska Department of Roads have expressed it this way:

"The Department makes rather extensive use of the agricultural soil maps which are published by the Conservation and Survey Division of the University of Nebraska and the U. S. Department of Agriculture. It has often been said that this group of maps is one of our most valuable aids for soil survey and materials prospecting work. A tremendous saving in time and money has been effected in the past 20 years through the daily use of these maps."

The SCS, on the other hand, uses the Bureau of Public Roads engineering test data in connection with construction of dams and other structures and, more recently, in determining suitability of soils to support housing and other developments in urban areas; and incorporates the information in all of its present-day soil survey reports.

Improved safety is another product of highway conservation, along with its economic and other benefits. As a result of prevention of road flooding, earth slides, and other hazardous conditions, highway accident tolls can be, and fre-

quently are, measurably reduced. Even seeding grass along the edge of the pavement—not just on cutbanks and fills—results in safe road shoulders, as well as providing erosion control and beautification.

Specially designed structures, adapted grasses, trees, and shrubs, and other conservation "tools" are used in the accelerating program of protecting and improving the country's highways and byways. Some of them are illustrated by articles in this issue of SOIL CONSERVATION. Each one has its place. Used together, they are getting a highly important job done.

Roadside Erosion Control

At Air Force Academy

By Robert K. Griffin

ROADSIDE conservation measures have restored scar areas to their original natural beauty on the Air Force Academy lands north of Colorado Springs in Colorado.

A drive through the area attests to the fact that roadside cut and fill scars can be treated to stop erosion, and that the erosion-control structures can be blended into

the landscape, too, if they are laid out and built carefully.

A factor in the selection of the site for the Academy work was its scenic beauty. Towering mountains form a natural, majestic background. Pine-clad hills, skirted by valleys of grass, blend into a wide rolling grassland.

But it was inevitable that construction of the major roads would

destroy much of this beauty. In addition, erosion of the scar areas would add to the problem.

Realizing what it was faced with, the Air Force Academy Construction Agency called upon the Fountain Valley Soil Conservation District for help. Before long, the district had a team of Soil Conservation Service men stationed at the Academy. Their task—to stop the erosion along the roadsides and to revegetate the ugly scar areas.

The original road construction plans had called for cut and fill slopes to be left on a 2 to 1 plane; but it is virtually impossible to vegetate slopes this steep in an area of only 16 inches of annual precipitation. Therefore, the first step in erosion control was to flatten the slopes to at least 4 to 1. As this was being done, the longer slopes were benched, a process which involved building graded diversions across the slope to carry floodwaters away from the scars.



Typical diversion ditch, sloped for easy seeding (r.), diverts floodwater away from fill on Academy's north entrance road in shadow of Rockies.

Note:—The author is work unit conservationist, Soil Conservation Service, Colorado Springs, Colo.



Some rills were 2 feet deep on this slope after only 2 years.



Here, slope has been flattened, protected by ditches above, and trees planted on it.

Ditches were built at the top of the cut slopes to intercept and divert any water that might have concentrated on the slope itself.

Topsoil, stockpiled during road construction, was used to plate the entire disturbed area. To protect the slope during grass establishment, straw mulch was spread on the topsoil, held in place by crimping it into the soil. The last operation was to drill the grass seed.

Because of their position, some roadside slopes could not be flattened appreciably; and, because they were too steep for equipment use, seed was broadcast, and straw was held in place with wire mesh.

Two years of above-normal precipitation has resulted in good stands of grass on many of the scar areas. Diversion ditches have controlled floodwater. Today, much of the roadside area appears never to have even been disturbed.

Better Plants For Raw Banks

By R. B. Thornton and C. L. Williams

MILLIONS of acres are being stripped of their protective vegetative cover each year in the process of building highways, military installations, airfields, dams housing developments, and other large-scale construction projects.

Although all this acreage does not fall into the category of critical erosion-producing areas, much of it does, including denuded portions which are inaccessible and are difficult to seed, fertilize, and manage. Among the critical areas are cut and fill slopes, constructed barricades, waterways, earth dikes, and portions of airfields.

Initial establishment of an effective cover for these areas has its own problems. Maintenance of this

cover more often than not, with respect to the cost factor, becomes the major problem.

Horticultural literature always instructs the gardener to condition his soils to the needs of the plant. This is hardly a sound proposition with the acreages involved in this problem. The approach, therefore, must be that of finding the plants which will grow and persist on the various soils and exposures with the minimum of adjustment of lime and fertilizer applications. To do this we must recognize the stages in the ecological succession of plants in the area involved. It

Note:—The authors are, respectively, manager, Plant Materials Center, and plant materials technician, Beltsville, Md., both of the Soil Conservation Service.



This U. S. Navy photo shows a slope at the Propellant Plant at Indian Head, Md., protected by year-old fescue and crownvetch.

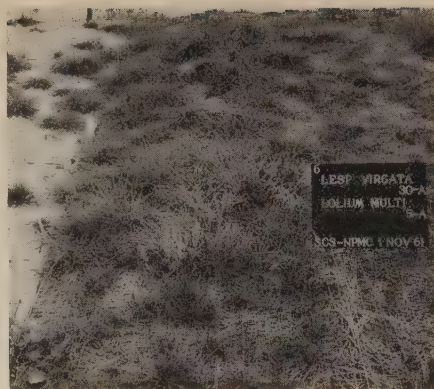
means that we must return to an early stage in the succession of plants and select the pioneer types which can and do find themselves at home on these raw banks.

The highway departments are heavily involved. The projected new interstate highway system alone calls for 41,000 miles of modern highway construction. Ordinary first class highways require 25 acres or more to the mile; whereas many of the superhighways like the Pennsylvania and Ohio turnpikes require more than 50 acres a mile. A fair percentage of this land has to be revegetated and maintained. The task is getting so big that already highway engineers and maintenance men are looking for ways to reduce their maintenance costs:

The plants most widely used at present are selected from crops developed for forage production. Use of this type of plant has many times resulted in failures, and the resulting covers usually require an expensive maintenance program of fertilization with repeated mowings. Often, they revert back to a lower order of plants, most of them undesirable.

During the fall and winter of 1959-60, the National Plant Materials Center of the Soil Conservation Service at Beltsville, Md., in agreement with the Department of the Navy, initiated a study of low-maintenance ground covers. After an initial screening of more than 120 selections representing 55 genera, a few were planted on exposed subsoil sites, including areas where previous seedings of forage crop species had failed. Some trials involved spaced plantings to study rapidity of cover growth. Other trials involved direct seedings.

Although the duration of the project has not been sufficiently long to answer accurately many questions, some guidelines are evidenced: Expensive topsoiling and seedbed preparations are not mandatory to the success of seedings on exposed subsoil sites or constructed



Lespedeza and ryegrass protecting treated slope section.

earth embankments, if the correct species of plants are employed. Fertilization for transplanted materials should be under the plant rather than broadcast over the area as applied with seedings.

A few plants such as carpet bugle (*Ajuga reptans*), wichura rose (*Rosa wichuraiana*), drug speedwell (*Veronica officinalis*), mother-of-thyme (*Thymus serpyllum*), and lilyturf (*Liriope graminifolia*), are showing much promise toward providing the desired cover. They will probably have to be supported by a temporary companion crop until they spread sufficiently to fill the spaces between plants.

Combinations of cool-season and



Wichura rose 3 months after planting on mulched bank.

warm-season grasses and legumes which should provide an effective winter-summer green cover, thus providing a low fire hazard, appear feasible. Species which appear promising for the climatic zone involved—parts of the Piedmont and Appalachian zones—are red fescue, Canaia bluegrass, several lespedeza species, small burnet, and crownvetch.

The species may change with the plant growth zone involved, but with mulching, fertilization, liming, and cognizance of the slope's aspect, effective vegetative covers are obtainable in most places if species are selected from the group of plants that may be called "the pioneer group."

Considering the cost factors involved in direct planting as compared to transplanting of plants, it becomes quickly obvious that the operations involved in direct seedings will be cheaper. In the direct seedings used, the rates per acre went from a high of 60 pounds to a low of 25 pounds. By the same token, when using plants, the farther apart they can be placed and the greater the rate of spread obtainable, the lower the initial cost will be. Thus a 2- by 2-foot spacing would require approximately 10,900 plants per acre, a 3- by 3-foot spacing 4,840 plants, and a 4- by 4-foot spacing would require only 2,700 plants.

Work is continuing on all these aspects of the direct plantings and seedings with a view to speeding up to the extent practicable the use of these techniques in helping to deal with a growing problem.

Have You Seen?---

• "Rural Areas Prosper Through Small Watershed Program," released by USDA as Picture Story 138. This pamphlet shows graphically how the watershed projects benefit varied individual and community interests.

Pesky Weeds Licked

As Roadside Problem

By Robert F. Tegner

(Note: Idaho in 1939 was one of the earliest States to undertake a highway erosion-control program in cooperation with the Soil Conservation Service and others concerned with such problems, including those of weed control. Your editor knows, because he was there and wrote stories about that pioneering highway conservation work!—Editor.)

WIND and water have taken their toll on Idaho highways—especially in the construction stage—but the weeds that come in to take over have been just about as pesky!

Happily, however, cooperative work of the Idaho Department of Highways, soil conservation districts, and the Soil Conservation Service has been writing an erosion and weed-control success story in Idaho for nearly a decade. Consultation between the SCS and the Highway Department had gone on for a decade and a half before the farmers' and ranchers' districts formally entered the field.

Highways are costly enough without having to "doll them up," and Idaho engineers were pressed to make highway dollars produce as much roadway as possible. But as wind, water, and weeds wreaked havoc with soil and scenery, it became increasingly obvious that something more than "dolling up" was needed.

In 1953, noxious weeds, which nearby farmers were fighting in their fields, were plaguing the Idaho Highway Department, especially along a stretch of Highway 30 North between "I Go Pass" and Pocatello. Knowing from past consultation that the SCS had the

technical answers to such problems, highway engineers turned to it again for help.

As a result, the Power Soil Conservation District agreed to eradicate weeds and seed the right-of-way with its own equipment and supplies, at cost. A formal agreement was signed—the first of many which have been executed in the 9 years since.

From this first contract came a sample cooperative agreement form, including specifications, species, seeding rates, fertilizer, and other pertinent items, prepared for use by other soil conservation districts and the Idaho Highway Department.

"The idea has spread, also, to districts and highway departments in adjacent States," SCS State Soil Conservationist Luther Jones said.

The whole arrangement is mutually beneficial. Dollar-conscious highway officials get erosion and weed control at cost. Farmers, who

are trying to rid their fields of weeds, can be confident the State is doing likewise along highway rights-of-way; and they share with others of the motoring and taxpaying public the pleasure of highways that not only look better but cost less to maintain.

Roy Harden, assistant chief of the Highway Department's design section, said difficulties encountered where timing or other circumstances prevent immediate seeding only serve to demonstrate the effectiveness of the control program elsewhere. Fifteen to 20 percent of some fills have been eroded by winds whipping the fine-textured soil where control measures could not be initiated in time to prevent it.

The Department has been consulting with SCS personnel since the '30s, Harden pointed out. The SCS had soils and plant information to determine types of grasses, trees, and shrubs that would grow in the particular areas. The High-



2-year-old stand of alfalfa and grass on steep fill in East Side SCD.

Note:—The author is information specialist, Soil Conservation Service, Berkeley, Calif.



The Gooding SCD made this highway erosion control crested wheatgrass planting with its own equipment.

way Department on its own, with advice from the SCS, has seeded

more than 5,000 acres of borrows, banks, and fills.

Most seedings have been of crested or sodar wheatgrass. In addition to the seeding, straw mulch has been applied in many areas, at a rate of 2 tons to the acre, along with 200 pounds of 16-20-0 fertilizer. The seed sometimes is drilled through the mulch. The program also has included experimental shrub and tree plantings.

Erosion and weed control now have earned a significant place in Idaho's highway plans. As a result, more and more of the State's modern ribbons of concrete and macadam are flanked by banks of vegetation, eliminating scars which for years made conservationists and highway engineers shudder—along with the motoring public.

West Virginia Road Commission

Sets Conservation Pattern

By Norris R. Caryl

THE State Road Commission of West Virginia is playing a key role in making the small-watershed program a reality in the eastern part of the State. Cooperating with the five-county Potomac Valley Soil Conservation District, the Road Commission has become a full-fledged partner in the flood-prevention programs in the Upper Potomac River Basin.

Two 50-year contracts are the basis for this unique partnership between the Commission and the U. S. Department of Agriculture. In them, the State Road Commission accepts full responsibility for maintenance of 58 retarding dams and some 4,500 feet of stream channel.

These structural works of improvement are part of the small-

watershed programs developed for the South Fork River and Patterson Creek. The South Fork is a 185,000-acre watershed in Highland County, Va., and in Hardy and Pendleton counties in West Virginia. The 182,000-acre Patterson Creek watershed lies in Grant and Mineral counties, W. Va. Total installation cost for each program exceeds \$5 million.

Federal technical and financial help for development of these watershed programs was provided through the Soil Conservation Service. Local costs are principally for obtaining easements, rights-of-way, and for operation and maintenance of the completed dams and stream channel.

Financing of local responsibilities was a problem; but financing the estimated cost of \$339,460 for easements and rights-of-way for all

structures in both watersheds was worked out through donations and contracts. Ten-year contracts were executed between the Potomac Valley District and the county courts of Hardy, Mineral, and Pendleton counties and the Town



Earth spillway of dam in South Fork watershed on Rt. 33 east of Brandywine, W. Va.

Note:—The author is area conservationist, Soil Conservation Service, Romney, W. Va.



Flood-prevention dam in New Creek watershed is seeded to birdsfoot trefoil and tall fescue.

of Moorefield, for a total of \$60,000. A plan to finance maintenance of all structural measures, at an estimated annual cost of \$11,200, was more difficult to attain. In the early stages of developing the plans, it became apparent that State roads, bridges, and culverts were one of the major items of flood damage, of an average annual damage to State road property of \$276,915 in the two watersheds. The watershed work, when completed, would reduce this to \$95,284, or an annual savings to the State Road Commission of \$181,631. The average annual cost of \$11,200, added up to an attractive return of \$16 for each dollar of cost.

The local finance committees contacted county and district State road commission officials. They were interested and eager to cooperate. As expressed by one commission official: "It was just good business, and an opportunity for the State Road Commission to be of greater service to the local people."

Working out all the details of the maintenance plans and contracts included many legal problems, such as the legality of the State Road Commission's entering into such a contract with the Potomac Valley District, all of which were solved. For example,

included in the proposed contracts between the State Road Commission and the District was this provision:

"The Potomac Valley Soil Conservation District agrees that all works of improvement will be covered by legally recorded easements in favor of the District which will permit the State Road Commission of West Virginia ingress and egress to and on the sites of works of improvement for inspection and maintenance purposes."

After months of work, on August 14, 1958, a 50-year maintenance

contract for the South Fork watershed between the Potomac Valley district and the State Road Commission was approved and executed. A similar contract for the Patterson Creek watershed was executed in March 1962.

The execution of these contracts represents a \$560,000 obligation by the State Road Commission over a 50-year period. It made possible the start of two \$5 million flood-prevention programs, with annual average benefits of \$612,020 to the people in the watersheds, county, and State. Both programs have been approved by the U. S. Army Corps of Engineers. They have been made an important part of the Corps' recently recommended Comprehensive Plan for the Development of Water Resources of the Potomac River Basin.

The going South Fork and Patterson Creek small-watershed programs are examples of cooperation between local, State, and Federal agencies, and the people living in the watersheds. All played an important part. For the first time, the State Road Commission has formally accepted a major and vital part in the small-watershed program in West Virginia. It is doubtful that these programs would be under way without this support.



Ready for seeding, highest earthfill dam (88 ft.) built with SCS help in W. Va., in Potomac Valley SCD and New Creek watershed, protects town of Keyser.

Fertilized Native Plants

Promise Quick and Cheap Roadbank Protection

By E. C. Richardson and E. G. Diseker

RESearch at the Coosa Watershed Research Project in Georgia is showing that fertilizer and lime will encourage naturally seeded native plants. This finding is significant as an inexpensive means for reducing erosion. Fertilizer and lime can be easily applied on existing county and State roads where high costs of vegetative establishment by other means may be prohibitive.

Observations of unvegetated roadbanks in the Piedmont area of Georgia showed many native species actually had established themselves, although they were so small and impoverished that it was hard to see them. In such a state of arrested development, they gave no protection against erosion. As a result, the roadbanks eroded badly, creating sediment problems in streams and reservoirs, causing traffic hazards, and greatly increasing the cost of roadside maintenance.

The impoverished native species found on the roadbanks in the Georgia area, around Cartersville, were broomsedge, beggarweed, perennial lespedezas of both upright and trailing type, and several others. Discovery that native species offered real promise resulted from a series of experiments devoted largely to determining the value of various domesticated plant species for roadside revegetation.

In these experiments, a complete fertilizer was applied, along with lime, and with and without surface mulches. Wherever the planted domesticated species failed because of low winter temperatures, high

summer temperatures, or late plantings of warm-season species, the native vegetation came in. Furthermore, treated but unseeded check plots soon produced a flourishing growth of native species which rapidly stabilized the area.

The responses of the native species to soil fertility treatments were so great that a separate study on fertilizer rates was initiated. Experiments were laid out in which 4-12-12 fertilizer was applied at rates of 0, 250, 500, 1,000, and 2,000 pounds an acre, with 2 tons of lime an acre, and worked into roadbank surface where impoverished plants already grew. The initial fertilizer treatments were applied March 11, 1958. Nitrogen was applied, at the rate of 50 pounds of N an acre, in June 1958.

Maintenance fertilizer treatments in 1959 consisted of 250 pounds of 4-12-12 an acre to plots which received the same amount in the in-

itial application. All other plots were fertilized with 500 pounds of 4-12-12 an acre in March 1959. Nitrogen was applied again in June 1959, at the rate of 50 pounds of N an acre.

Brush and rough plants were removed once during the growing season. Native cover species were never cut. They were allowed to make maximum growth during the frost-free growing season to produce seed which shattered on the land. The standing plants acted as a trap for seed moved by wind.

All of the different rates of 4-12-12 plus nitrogen resulted in vigorous growth and development of the native species as a protective cover on the lower two-thirds of the bank the first growing season after fertilizer treatment. During the second growing season, the cover extended up the bank and filled much of the remaining open area with new seedlings. With the ex-



Roadside bank before treatment.

Note:—The authors are soil scientist and agricultural engineer, respectively, Soil and Water Conservation Research Division, Agricultural Research Service, Cartersville, Ga.



After treatment without seeding: Center plot not fertilized; right plot received 2,000 lbs. per acre of complete fertilizer and lime and nitrogen, and left plot 250 lbs.

ception of the check plots, 250 pounds of 4-12-12 plus nitrogen treatment produced the poorest cover. The 1,000 pounds of 4-12-12 plus nitrogen was almost as good as the 2,000 pounds an acre rate but not much improved over the 500 pounds an acre rate.

Broomsedge and poverty grasses

were the predominant native species that developed during the first 2 years. Their seeds were probably transported by the wind much easier than the heavier seeded species, such as native perennial lespedeza. A cover of honeysuckle, dewberries, and other native species also developed as a result of

fertilizer application.

It appears that roadbanks may be conserved quickly and cheaply in the Southern Piedmont by applying 500 pounds of 4-12-12 fertilizer an acre from February to May, followed by 50 pounds of N an acre in May or June. In all probability, these results with native species could be duplicated in many other areas, but only those areas with a fair stand of native plants should be so treated. Areas totally void of vegetation should be completely seeded. Generally, the areas that can be stabilized by fertilizer treatments only will be found along the older roads.

On very steep roadbanks with 1 to 1 or 2 to 1 slopes, it is essential to mulch the surface to hold the fertilizer and lime until vegetation can be established.

No. 69

This is the sixty-ninth of a series of articles to appear from time to time in explanation of the various phases of research being conducted by the Department of Agriculture on problems of soil and water conservation.

Maryland Highway Conservation

Provides Scenic Recreation Spots

By Lester Fox

THE Maryland State Roads Commission provides more than smooth highways on which motorists can glide safely and smoothly. It is at the same time furnishing a pleasantly scenic background and roadside facilities for recreation.

Take State Highway 22, for example. When plans for its improve-

ment were made a few years ago, the roads commissioners kept scenic beauty and recreation in mind. They frowned on commercial advertising along the route. They looked for suitable sites for farm-type ponds.

Soil Conservation Service technicians found a pond site just a mile from the center of Bel Air, a growing community bulging with an influx of new residents from Baltimore. It was a swampy area



Children have fun fishing in Westminster community pond.

Note:—The author is field information specialist, Soil Conservation Service, Upper Darby, Pa.



Westminster community pond in setting of countryside, highways, and city.

at the edge of the highway on a farm owned by the Joseph N. Umbarger estate, a cooperator of the Harford Soil Conservation District. The estate gave $5\frac{1}{2}$ acres to the State. There was no intention of gaining any benefits from the gift; but, when the SCS-designed $11\frac{1}{3}$ -acre pond was finished, it drained the farm's wet spot. Cows now graze those 3 or 5 extra acres that before were idle and were not even used by waterfowl or other wildlife.

The main thing, though, is the recreational use that the people of Bel Air get out of this conservation pond. Go there around 5 o'clock any summer afternoon, and you'll see families gathering for picnic suppers in cool, pleasant surroundings. And on any warm, sunny day, year-round, you'll see families enjoying an outdoor meal at the side of the attractive pond.

About 600 people find pleasure each month at this pond during the warm half of the year. Come winter, and the pond beckons to the skaters of Bel Air—more than 4,000 of them during the season.

Skip over to Westminster and you'll find the same thing: A highway farm-type pond serving the outdoor recreational needs of this

community of 10,000 persons.

Before these ponds were put into the State highway scheme of things, the people had a long way to go for outdoor recreation. At the Bel Air pond a rustic sign says:

Bynum Run Picnic Area
And Community Pond
State Game and Inland Fish
Commission
State Roads Commission



Bynum Run community recreational pond draws picnickers, fishermen, skaters—and ducks!

The Roads Commission built the pond, local contractors doing the work. The commission also planted trees, shrubs, and grass around the pond, and maintains the property. The State Game and Inland Fish Commission chipped in some cash to help pay for the pond, and stocked it with bluegills and bass.

The Izaak Walton League fenced the pond site on three sides, leaving the area bordering the highway open. It also built two large fireplaces, which are supplemented by a number of small grills. Yearly, during Maryland's "Land Week," sponsored by the Maryland Association of Soil Conservation Districts and cooperating agencies and conservation organizations, the League holds a gathering on the site.

The Lions Club put in floodlights to illuminate the place at night. Elsewhere in Maryland, other service clubs have helped in similar recreational developments. Always there has been a community of interests working together for the common good, with the State Roads Commission keeping an eye out for recreational sites along its extensive highway system.

County Builds Road To Serve Watershed Project

By Roy M. Davis

WHAT is considered to be the largest floodwater-retarding structure in Kansas created a road problem on the Aiken Creek Pilot watershed. But the county commissioners cooperated with the Chautauqua County and Montgomery County soil conservation districts, the project sponsors, in solving it.

During the planning stage, with help of the Soil Conservation Service, it was determined that the single pilot watershed structure would back water over a road during medium to high levels of the flood or detention pool. This road was an important outlet for a few families. Heavy rains could cause it to be under water for several days.

The district supervisors saw that this prospect could block the pilot project; so they suggested to the county commissioners and engineer that either a high bridge and fill be built or that the road be rerouted on the other side of the reservoir. Although the county engineer considered both suggestions to be too

expensive, the supervisors emphasized to the commissioners the value of the flood-prevention measure, and the need for a demonstration project; and it was decided to reroute the road at county expense.

When the floodwater-retarding structure was completed, it had a sediment pool surface area of 31 acres and a flood pool surface area of 214 acres, with a total capacity of 2,736 acre-feet. Soon after its completion the rerouted road also was finished. This road project consisted of about 2 miles of new grading and graveling. The cost

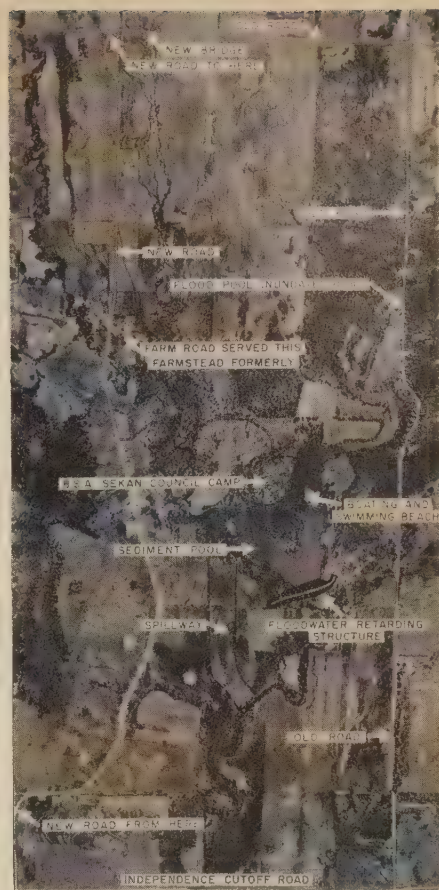


Stretch of the new road.

to the county was about \$17,500. The county commissioners agreed to leave the old road open and to maintain it for use during low-water stage. A large sign was erected on the road on each hill bordering the creek to warn travelers of high water after heavy rains.

The whole undertaking was a demonstration of community and county government cooperation to

Note:—The author is area conservationist, Soil Conservation Service, Emporia, Kans.



New road (l.) and old road (r.) in this Aiken Creek pilot watershed mosaic.

get a watershed project installed. The success of the project and the benefits it has brought testify to the sound wisdom in the conservation planning.

Have You Seen?---

• "Agricultural Land Resources—Capabilities—Uses—Conservation Needs," published by USDA as Agriculture Information Bulletin 263. This bulletin gives a digest of the National Inventory of Soil and Water Conservation Needs on private agricultural land, with charts and maps portraying the major findings.



Those using weedkillers should follow spraying procedures that help confine tiny weedkiller particles to the sprayed area.



Sign warns travelers of old road.

If your address changes, please notify us of your complete new address, including zone or RFD number, and include old address with our code number as shown above.

HISTORICAL MARKER

THE BROWN CREEK SOIL CONSERVATION DISTRICT- FIRST IN AMERICA

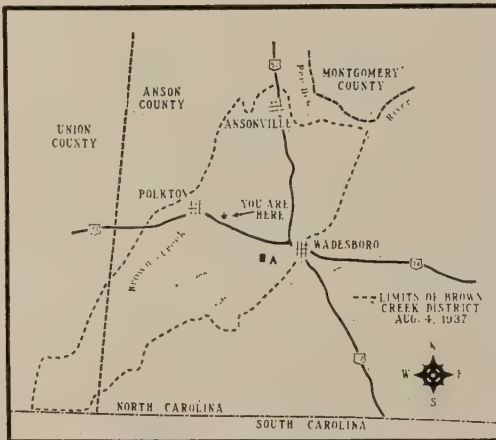
Here was established the first district in America for a systematic program of land erosion control. Known as the Brown Creek District because it embraced the area of the Brown Creek Watershed, it heralded the beginning of a national program of soil conservation districts.

The Brown Creek District included the plantation birthplace of Hugh H. Bennett, "father of soil conservation" (A). Bennett, born in 1881, graduated from the University of North Carolina in 1903, and became a soil surveyor in the Bureau of Soils, Department of Agriculture. Observing that soil erosion ruined much good land throughout the United States, Bennett slowly initiated a program to prevent this waste. On April 27, 1935, Bennett became director of the Soil Conservation Service, a position which he held until his retirement in 1952. By this time soil conservation was a national concern, largely because of the work of Hugh Bennett and his associates.

The success of the soil

conservation district program was due to local participation by farmers and landowners. Conservation districts were created throughout the United States. Bennett and his specialists worked with the farmers in the districts for an effective program.

The Brown Creek District was established in 1937. In May thirty local property-owners petitioned the State Soil Conservation Committee "That there is need, in the interest of the public health, safety, and welfare, for a soil conservation district to function in the territory hereinafter described." The district would embrace 120,000 acres, much of it badly eroded. The petition was approved on May 31. A public hearing, held on July 3 at Wadesboro and followed by the mailing of ballots to the local farmers, resulted in an overwhelmingly favorable vote for creating the district. The North Carolina Secretary of State issued a certificate setting up the district on August 4. The Brown Creek District became the example for districts of the future.



ARCHIVES AND HIGHWAY DEPARTMENTS, 1942

This large metal tablet on U. S. Highway 74 in Anson County, N. C., in memory of Dr. Hugh H. Bennett and commemorating the Nation's first soil conservation district (Brown Creek) is one of several historical markers erected by the North Carolina State Highway Department. It was dedicated August 7, during a tour by the district supervisors and others attending the National Association of Soil and Water Conservation Districts southeastern area meeting at Durham. On the same day, a monument commemorating the first soil conservation district plan was dedicated on a plot of ground donated to the national association by the widow of Dr. Furman Y. Sorrell, who was the first cooperater with the Brown Creek district. The group also visited the Bennett homestead, which may be considered for designation as a national historic shrine to the man who, as the sign indicates, became known as the "father of conservation."

NOVEMBER 1962

Soil Conservation



SOIL CONSERVATION SERVICE • U. S. DEPARTMENT OF AGRICULTURE



Growth Through Agricultural Progress

Soil Conservation 25 Years Ago

"A new concept of the farmer's and society's interest in the land has appeared and gained acceptance. Put very broadly, this new concept assumes that society has an interest in the privately owned farm which is at least equal to the interest of the owner himself. If this assumption is sound . . . obviously it throws new duties both upon the landowners and society. It becomes the duty of the landowner so to handle his land as to conserve the soil and its fertility in the interest of society, and it becomes the duty of society to assist the landowner to make the best use of his land."

"Rural zoning provides a democratic means by which local groups of people may exercise reasonable control over the use of their resources in land. It is but a method of applying control by collective action over the use of land and buildings, public or private in the interest of the general welfare."



COVER PICTURE—Hickory Corners, a small community in Pennsylvania's Stone Valley, typifies rural communities, villages, towns, and cities throughout the country which are being protected against the ravages of soil erosion, flooding, and sedimentation by such conservation measures as the stripcropping seen here.
—Photo by William R. Berkland.

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Soil Conservation

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FRANK B. HARPER, Editor

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The Businessman And Conservation

By Walter B. Garver

THE Nation's business community has been one of the staunchest supporters of the countrywide soil and water conservation movement from its beginning. This recognition of a practical approach to sound management of these basic resources has not been based on any superficial altruistic premise. It was just good business—and still is!

Chambers of Commerce over the country, in common with service clubs and other businessmen's organizations, have taken advantage of opportunities to further soundly conceived local and State conservation programs that are in the public interest; and the National Chamber likewise has lent its weight to the advancement of such programs.

Among such opportunities has been that of encouraging the organization of soil and water con-

servation districts by landowners under State enabling laws, and supporting their work of rural community improvement. Special awards to outstanding conservation district farmers, sponsored by Chambers of Commerce, Junior Chambers of Commerce, and other business groups, and by banking and other business interests, have been an incentive to continued effective working relationships between farm producers and customers and business and professional people in town. So have conservation advertising and publicity provided by many Chambers of Commerce and member businesses.

Locally initiated watershed protection and flood prevention projects have in more recent years opened the way to still broader conservation contributions by business interests. That is because



Walter B. Garver.

these projects are community-wide undertakings, which often involve direct flood protection or other benefits to business or industrial property, in addition to the conventional conservation returns of more stable and prosperous farm operators and better business for merchants, processors, and manufacturers. Furthermore, this is consistent with the important principle of public policy of meeting problems at the level of Government and responsibility where they can be most effective.

The Chamber of Commerce—to mention one other example—was one of the approximately 100 organizations, businesses, and agencies to cooperate with Kiwanis International in sponsorship in 1955 of the first Farm-City Week, being observed this year November 16 to 22. Because soil and water conservation has come to be recognized as such an important link between town and country, cooperation on conservation unquestionably has helped measurably in making this observance a permanent and yearly more helpful institution.

I have called attention to these, some of the many ways in which the Nation's business interests—from the village merchant to our



Communities suffer when floodwaters and sediment sweep down from insufficiently protected watersheds.

Note:—The author is manager, Agriculture and Natural Resources Department, Chamber of Commerce of the United States, Washington, D. C.



Conservation makes for prosperous farms—prosperous farms mean better business.

big machinery and other industries, utilities, and others—have sought to help bona fide soil and water conservation; because there is no generalization that otherwise would describe how businessmen think of soil conservation. Like others, their views depend largely on their grasp and knowledge of soil behavior and problems, some of which necessarily are quite technical. The way businessmen look at it depends, also, on the impact of programs on their short-run and long-run profit and survival problems. This includes their specific stake in the business of servicing and supplying the conservation requirements of farmers and programs, and their general stake in farm income and the business derived from it.

Businessmen necessarily look at resources, especially land and soil, as a source of wealth (food, fiber, minerals, petroleum, etc.). As such, the standard by which they judge resources is their potential or actual usefulness to man. Economic contributions are the criteria, which means that “string savers” and hobbyists are by no means necessarily conservationists.

Many businessmen look upon conservation as a working “bank.” Increasingly in today’s world they are forced to look at the long-term use of resources and capital. They are generally, therefore, adverse to short-run “mining,” and look more to the long-run maximizing of wealth and income, rather than to quick profits and returns just for today, or this year.

Many businessmen who are fully involved with soil conservation—and they are many over the country—are disturbed by the lack of public understanding of the true meaning of conservation, and of the necessity for sound programs in the public interest of all citizens, living and unborn. This lack unfortunately includes that on the part of some businessmen.

Some of the hurdles soil conservation has had to overleap have been imposed by well-intentioned “friends” of soil and water conservation who seem to have mistaken “soil conversation” for soil conservation. Businessmen also share with others a suspicion that some devotees are overzealous, with their own extreme biases and blind spots.

Businessmen also recognize that there are some things which farmers “ought” to do as stewards but cannot or do not do, and that there are others that farmers ought not to be expected to do. In these cases, businessmen generally accept the need for programs to accomplish what is clearly in the public interest. The critical question is “Who benefits—the recipient, or society?”

The soil today is increasingly a workshop in which soil amendments and plant nutrients, water, capital, labor, and management are combined, much like a fabricating plant, rather than a “mine” to be worked bare. There are many businessmen who have a direct stake in this “factory” process, and their views can be expected to reflect this relationship.

Soil conservation is inseparably related to water management. Sound management of soils, therefore, has two important aspects in this connection: (1) The prevention of erosion and loss of physical properties; and (2) as an instrument in the management of water, in which business and industry have a direct and vital concern.

Businessmen have seen in their own communities the improvement in farming and farm wealth, as well as the wealth of the community, as soil conservation methods and practices have transformed the agriculture and switched the enterprises of the areas. This has resulted not only in a better and more economically sound agriculture, but a more hopeful picture of the future and a greater long-run stability in both the physical resources and the income derived from them.

Unfortunately, we have a few protagonists who have made a dirty word of “exploitation.” In its legitimate sense it means to utilize, to make available, to get the usefulness and value out of. Unwittingly we seem to have accepted a more limited meaning to include only the illegitimate or destructive short-run use for immedi-

ate profit regardless of consequences.

Businessmen make a distinction between conservation to preserve from *change*—and to preserve from *destruction*. We are today

on the threshold of a new evaluation of soil, land, and water arising from changes in our economy, culture, and society. Conservation to preserve against change can be as negative and harmful as no con-

servation at all, especially if changing needs dictate policies that are destructive of *some* values, standards, and uses that must yield in an adaptation of resources to new needs and necessities.

SOIL SURVEYS SAVE MONEY

For City of the Alamo

By Herbert I. Jones

(Note: Bexar (pronounced "bear") County and San Antonio, Tex., for a number of years have set an example in farm-city conservation teamwork by sharing the costs of watershed and special soil surveys, and in other ways. The significance of their out-of-the-ordinary efforts to speed up flood prevention and land and property protection strikes home to the editor, because he was carried out of a water-filled apartment on the bank of the suddenly flood-swollen San Antonio River at 3 o'clock one morning back in 1913, and spent until the next afternoon in his rescuers' firehouse.—Ed.)

SAN ANTONIO is perhaps unique among American cities for its interest in the soil and time and time again that interest has proved to be good business for citizens and taxpayers of Texas' third largest city.

A recent case in point is the location of lateral gasline connections on a new 75-mile main encircling the city. San Antonio's utility engineers planned them for areas where soil survey information indicated there would be the least difficulty from underlying rock. The city's public service men also are using soils information to spot protection for all steel pipes, in an effort to curb corrosion losses estimated at more than

\$50,000 a year.

Soils information from the same survey also is being used in the city's newest park, in planning and construction of buildings, parking lots, play grounds, and planted areas.

William R. Hunter, San Antonio's special projects engineer, has been using the soil maps and information to schedule jobs and earthmoving equipment for a year now—ever since the city

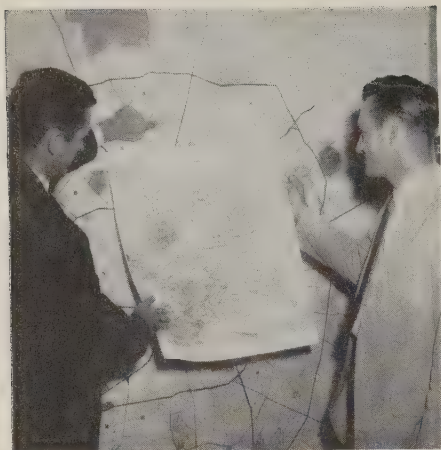
agreed to share the cost of an intensive city-suburban soil survey. He said that "savings on special projects alone are double what it cost the city to enter into the cooperative soils agreement we signed with the Soil Conservation Service."

Spokesmen for other divisions of the citizen-owned public utilities, the Public Works Department, and the Planning Commission value the survey equally highly.



San Antonio officials receive soil survey field sheets and descriptive materials from (l. to r.) Frank B. Taylor, SCS survey party leader, and Mike Stout, assistant State soil scientist; Special Projects Engineer William S. Hunter; Ben Pettitt of the Water Board; and Charles A. Tipps, Public Service Board corrosion expert.

Note:—The author is field information specialist, Soil Conservation Service, Denver, Colo.



San Antonio Director of Planning Steve Taylor (l.) and Assistant City Manager Jerry Henkel use SCS survey field sheets to check soils on proposed site developments.

Historic San Antonio of Alamo fame is bursting at all seams with new developments and renewal projects, with urban fringe areas having turned metropolitan almost overnight. All require earth to be moved. Trenches must be dug, streets cut, foundations set, utility lines placed, and recreation sites developed. The kind of soil encountered makes a difference in cost, or determines whether the work can be done at all.

"We've been running into soil problems for years," Geologist Ben Pettit of the city's Water Board commented during a pause on one of the latest trenching jobs, where he was checking earth conditions along a line aimed at a booming subdivision. "Corrosion, rock, and sand have been particularly vexing. While we always made intensive tests at construction sites, no one ever tried to make a systematic inventory of soils in the entire area. Most of the time we were face to face with problems before we knew what they were."

City Manager Jack Shelley added: "When we learned the SCS was doing soil surveys in Bexar County for agricultural purposes, we were interested. It looked to us like a lot of the information would be good for our planning—if the survey could include city and suburban land."

At Hunter's request, the Soil Conservation Service analyzed the city's needs and found that the soil texture, slope, and depth measurements made on farms and ranches would be useful, but that the city needed to know more.

"Soil character and depth to underlying rock, or at least down to 10 feet, was vital," SCS Work Unit Conservationist Don Windrow recalled. "Resistivity to the conduct of electrical charge, corrosion factors, unusual slope characteristics, and some very special soil descriptions would also be needed if the soil survey was to be useful for zoning, urban planning, tax evaluation, and construction."

San Antonio's City Council passed an ordinance on April 13, 1961, authorizing a contract agreement with the Service. It detailed general conditions and the special interest items to be included in the survey. For the added investigation normally not included in a regular agricultural survey, the city agreed to pay the SCS nearly \$9,000.

This action made San Antonio the first city in the State—and one of the first in the Nation—to

undertake an intensive soil survey of its urban land. Mapping of the 280 square miles covered by the agreement also was approved by the Texas Agricultural Experiment Station, cooperating in the soil survey.

Though the area in the city-suburban survey represents but a small portion of the 800,000 acres under study in Bexar County, it is the area of most intensive use, where changes are rapid and where mistakes could be costly. Realizing this fact, the SCS sent in three soils men. Any doubts skeptics may have had about the accuracy of their mapping of the city soils and the underground gravel, chalk rock, and stone were promptly erased when 5 miles of trenching for a new 20-inch gas main revealed soil conditions exactly as shown on the soil maps.

Every means to let people know what was going on was used—news releases; visits by newsmen and editors; radio and TV field broadcasts and motion picture filming; and soils displays sponsored by the Alamo Soil Conservation District Supervisors at flower shows, fairs, and other meetings.



William S. Hunter (r.), San Antonio's special projects engineer, with SCS Work Unit Conservationist Don Windrow and Soil Scientist Frank Taylor, discussing conservation planning and application in the urban areas and on Bexar County farms and ranches.

Although the soil surveyors didn't actually cut across private yards to make their survey, they did get as close to buildings as was practicable. They tested in vacant lots, and ran lines in unpaved alleyways, across golf courses, parks, and military installations, and along highway and railroad rights-of-way. They looked in foundation and footing cuts on housing and industrial sites. They mapped and tested in the busiest streets wherever the utility men cut the pavement. Physical analysis of selected soil samples was made in city laboratories and by the Texas Highway Department.

The official Bexar County report is not yet published, but San Antonio officials are correlating information from copies of the field sheets with existing city data, utility installation, and urban renewal plans and maps. City Manager Jack Shelley summed up the city's feeling about the soil survey and the information it provided:

"San Antonio, like every other American city that we know of, has grown fast. Expansion came so quickly there often wasn't time for adequate study of many of the ramifications of the development. But today—thanks in part to the soil survey—we are catching up. No official, department, bureau, or agency in San Antonio is now proposing construction without using the cooperative soil survey as one of their basic tools. The cost of the survey represents a mere fraction of the values already obtained. And we haven't even begun to use the information."

San Antonio's satisfaction with its soil survey has focused attention on the broader aspects of conservation—on watershed protection and flood prevention, among others in the offing. Recently, the city has seen the Salado Creek watershed project planned and approved. This plan very well may bring to parts of the city a measure of protection never thought possible not so many years ago.



Red clover in field 1.



Field 4 prepared for alfalfa planting.

Field Number Signs Solve Problem of Conservation Management By Mail

By Stanley Yusk

OSCAR BORCHERT of Michigan has to supervise management of his 600-acre beef-cattle farm in Tennessee mostly by correspondence with his tenant 500 miles away. Until he hit upon a novel means of helping him to carry out his soil and water conservation plan, developed with help of the Dickson County Soil District 2 years ago, he met with considerable, though understandable, confusion in his long-distance management-by-mail.

Because present-day farming demands close contact with the actual farming operations, city owner Borchert soon realized that management by correspondence has its drawbacks. For instance, a few fences were built in the wrong places, and several fields were sown to the wrong plants—all because, Borchert concluded, "the man on the farm was uncertain as to what fields were referred to."

During the development of his conservation farm plan a land-use

map was made by the Soil Conservation Service. The map divided the farm into 25 fields for conservation planning and treatment purposes. After studying this map, Borchert wondered why the same field numbers shown on it couldn't also be posted in the fields themselves to identify them.

"This would simplify my management problem," Borchert reasoned, "as well as help my farm operator in applying the soil conservation plan."

After a lengthy search, Borchert located some large white enamel signs numbered from 1 to 25, which he promptly bought and shipped to Farm Operator Odie Bailey. Now, when Borchert writes a letter from Detroit directing, say, the seeding of field 4 on his farm in Tennessee to alfalfa, he knows Bailey will not be uncertain as to his instructions, and that the right field will be sown to the right crop.



Mutual understanding between the farmer and the city man is vital to prosperity throughout our land.

Note:—The author is work unit conservationist, Soil Conservation Service, Dickson, Tenn.

Bankers Score in Kansas Grassland Management

By H. Ray Brown

PRESIDENT C. R. Hubbard of the Guaranty State Bank of Beloit is convinced that banking and grassland management have a lot in common in north central Kansas. In other words, the successful rancher lives off the interest instead of the principal, and maintains his grassland in a condition that it returns perpetual dividends.

It was in 1954 that Hubbard concluded it was as important for farmers and ranchers to understand the principles of range management as thoroughly as to know the principles of livestock management. Furthermore, one-third of Mitchell County, the area served by the bank, is native grassland.

Hubbard relates that, as a commercial bank, its officers felt they should have a program which would focus attention on the seriousness of grass exploitation,

proper management as being economically important to both the rancher and the bank, and the need to stabilize livestock programs so they would weather periodic droughts. The goal was to develop a grass consciousness among people of the area.

Hubbard relayed his ideas to Dean D. Haddock, vice-president and farm representative of the bank, for working out some type of range-management program. Haddock contacted range-management specialists of the agricultural colleges, experiment stations, Extension Service, and the Soil Conservation Service for ideas.

By using the information received, rules and a scorecard for the Mitchell County Range Improvement Program were formulated. The program contest, open to all, is sponsored by the bank, with cooperation of the Extension



Hubbard presents \$100 savings bond to 1st.-place winner.

Service, the SCS, and the Mitchell County Soil Conservation District. The bank awards a \$100 savings bond to the first-place winner, a \$50 savings bond for second place, and a \$25 savings bond for the third place.

The range is rated at the beginning and end of the season, in May and October. Scoring is based on trend of range condition, stocking rates within safe carrying capacity of the pasture, as based on degree of use, extent to which temporary or tame pastures are used, total months pasture of all types; placement of fences, watering places, and salt for better distribution of grazing; and handling equipment such as fences, pens, and feeding facilities. A committee selects four farms for the final contest.

During the May inspection, the judges consult with the farmer on the phases of his range-management program that appear weak, suggesting recommendations for improvement. The score at the end of the season is based on percentage points showing plus or minus changes. The contestant showing



DeWitt Abbott and Floyd Kensinger (l. to r.) explain proper range use to contestants on Joe Pruitt farm in Mitchell County.

Note:—The author is range conservationist, Soil Conservation Service, Hays, Kans.

the greatest seasonal improvement between inspections or, in dry years, the least seasonal decrease, is the winner.

Awards are presented on a public field day held during the fall evaluation.

Bankers and civic groups of

Lincoln and Cloud counties are sponsoring a similar type program as a result of the Mitchell County contest.

City Kids Have Big Weekend On Oregon Conservation Farms

By Louis Gilliam and Arthur W. Emerson

THE laughter of city school girls and boys—mingled with the hundreds of farm sounds of roaring tractors, the hoof poundings of saddle horses, mooing of cattle, barking of dogs, noises of chickens and trucks, and other farm noises—heralded the end of the first glamour day for 35 Portland 8th graders and their chaperons.

Nineteen boys and 16 girls were chosen last spring by teachers and principals of the Portland, Oreg., elementary schools to spend 3 drama-filled days on eastern Oregon farms and ranches—135 miles up the Columbia River.

In that weekend, they saw calf-branding, quarter horse colts at close range, combines and tillage equipment, striperopping, and grassed waterways. They visited Rock Creek School, one of the last remaining one-room country school houses in Oregon, worshipped on Sunday with their hosts in small community churches, and by that night were back home in the city—tired, thrilled, still a little mystified at what farm life is, and completely won over by the charm and hospitality of Oregon's Columbia Basin farm families.

The tour was sponsored by the Gilliam County Soil Conservation District, the Oregon State Univer-



Eighth-grader Carol Greiner of Gilliam County's one-room Mayville School greets Portland 8th Grader Eileen Harrington at start of weekend stay at James Greiner ranch home.

sity Extension Service, the Soil Conservation Service, the Portland Chamber of Commerce agricultural committee, Portland public schools, the Gilliam County public schools, 4-H officials, Gilliam County Wheat Growers Association, county granges, and the Gilliam County Farm Bureau.

One objective was a new type of educational-appreciation tour of rural life and conservation farming for city youngsters—so they could

learn and report "back home" to their families and school associates.

The Gilliam County organizational group for several years had developed soil and water conservation tours for local grade schools with excellent results. Meanwhile, Portland business firms had sponsored events to inform rural youth about the "big city." To the organizational group's knowledge, this type of "show me trip" for city school children had not previously been attempted. Here could be a tremendous opportunity for better understanding between the agricultural producer and the consumer of his goods.

This weekend adventure provided young people from city and farm a tailor-made opportunity to become acquainted and develop better understanding between urban and rural youth—showing how agricultural programs and conservation activities help all citizens as well as farmers and ranchers.

The expense-free trip by Gilliam County's Arlington School activities bus, with food and lodging furnished by host farm families, who took one to three students into their homes for Friday and Saturday nights, included meals and soft drinks furnished by local service clubs, the Arlington school cafeteria, and the host families.

One of the boys was overheard to

Note:—The authors are, respectively, work unit conservationist, Condon, Oreg., and field information specialist, Berkeley, Calif., both of the Soil Conservation Service.



Wayne Monahan shows off father's herd bull to city visitors, who also saw calves and conservation pasture unit.

say to a new friend: "You guys in Gilliam County are sure hospitable."

After showing of a film on wheat farming in the Columbia Basin, 14-year-old Portland student Henry Breithaupt commented: "Gee, I didn't realize there are so many women driving wheat trucks at harvest time."

After lunch Friday, the city visitors saw an old Oregon Trail marker, visited several farms and ranches, and saw stripcropping, erosion control dams, cross wind seeding, stubble mulch fallow, a seed nursery, and conservation practices on Rock Creek, with short, snappy explanations of each by Soil Conservation Service technicians. Then they were off to their hosts' homes, each of which had at least one youngster of the same age and sex as the guests. There, at first hand, they helped feed poultry and livestock, explored farm buildings, and got acquainted before bedtime.

Saturday morning, the city visitors saw an irrigation deep well, crested wheatgrass seed plantings, fence rows sprayed with weedkill-

ing chemicals, annual-cropping experiments, new variety wheat, and aerial weedkilling spray dropped from an airplane. They inspected farm equipment, a shop and fire station, a farm elevator for handling and storing wheat and barley, and stripcropping and grassed waterways. The farm host young-

sters went along on the tours and added their personal explanation of many new experiences for the visitors.

After a rest and lunch at the County Fair building in Condon, the visitors took in a demonstration of 4-H steers and how to prepare them for "fair showing;" saw a sagebrush eradication demonstration and annual-cropping experiments; and, by midafternoon, were again off to their hosts' homes for hot baths, and a bounteous Saturday night's farm home dinner, followed by parties during the evening.

On Sunday, all of the city girls and boys went to church with their hosts, after which they enjoyed lunches furnished by their hosts or at a church smorgasboard.

Sunday afternoon the city youngsters boarded their bus for the trip back home at 12:45 o'clock—happy, tired, but thrilled; while back to their homes went the numerous farm family folks who had made this great day possible—not only for their own children at home—but also for their city neighbors.

So successful was this school kids' farm-city get-together that plans already are beginning to form for another such weekend next year.



"Bullseye" contour stripcropping on Bill Jaeger farm near Condon seen by Portland 8th graders.

Businessmen Sponsor

Annual SCD Day

By Don Tootell

EACH year with the first hint of fall Chairman Frank Schatz of the Lewis and Clark Soil Conservation District in Montana brings the subject up and presently plans for another District Conservation Day are under way.

Those attending the annual event are guests of Lewis and Clark County businessmen, who help with planning the program and making arrangements. The bill for the February 1962 Conservation Day was \$531.41. Twenty-seven firms paid it.

That program began with a turkey dinner. The audience heard a discussion of weed control in Montana, "traveled" on a colored slide tour with Cascade County Agent Ted Fosse through historical and agricultural Egypt, and stood by while ballots for the annual election of soil conservation district supervisors were counted.

Note:—The author is work unit conservationist, Soil Conservation Service, Helena, Mont.

With a businessman, Joe Hamm, serving as master of ceremonies, each sponsor stood for a moment in the spotlight while the audience applauded. Supervisor Paul Kleffner reviewed the soil conservation district's activities. Others on the board—Schatz, Myrlin Donaldson, Frank Thompson, and Roland Mosher—also took a bow.

Why do these businessmen take part in such an activity? Let one of them, Carl Schiller, tell it:

"We think this is one of the best ways we can help out in getting soil conservation done," he said. "We all have a chance to help now and then. But we must understand the problem and its solution before our efforts can be of any real value. One important result is that we here in town get to know our rural neighbors better. We can be a lot of help to each other."

Is the help from the businessmen important to the soil conservation district Board?



Businessmen and supervisors plan Lewis and Clark SCD "Conservation Day."

Chairman Schatz put it this way:

"We'd find it hard to get along without the help from our friends on Main Street. They are quick to put a shoulder to any worthwhile project. There's our newsletter, a very handy communications tool. They help with that. Then, most businessmen own land or have friends who do. That makes a real difference in getting our kind of job done. Yes, we count on the businessmen heavily in our district. They have proved themselves our teammates time and again."

Insurance Company Sponsors SCD Report Contest

The Androskoggin Mutual Fire Insurance Co. is sponsor of the Maine Soil Conservation District 1962 Annual Report Contest.

Judges for the competition, closing March 15, 1963, will be from the Lewiston Daily Sun and Evening Journal editorial staff.

Contest instructions specify that "your report, in addition to being a 'Report to the Stockholders,' should be a newsy report to the public so that they will know what your district is, what it is doing, and what it is trying to do."

Presentation of the winning trophy will be at the summer meeting of the State Association of Soil Conservation Districts in 1963.



Part of crowd at 8th annual Conservation Day in Helena, Mont., at which 27 businessmen were hosts.



William J. Klein.

"DEAD" acres do not pay for farm equipment.

So it seems almost self-evident that the farm equipment industry has had and will continue to have a deep and abiding interest in soil and water conservation activities; for the financial welfare of the farmer depends upon the productivity of his soil, which can be achieved only by intelligent land and water management. The farm equipment industry is interested in conservation because it knows conservation pays. Farmers who use their land well are customers not only for the machinery of the kind the industry sells, but are customers for everything that is purchased.

For many years, consequently, the hundreds of companies in the farm equipment industry have worked with the Soil Conservation Service of the U.S. Department

Farm Equipment Industry Furthering Soil Conservation

By W. J. Klein

of Agriculture in promoting the objectives of soil and water conservation to the best of their abilities and opportunities. As a matter of fact, hundreds of thousands of dollars are being invested each year by these companies in advertising, publications, brochures, radio programs, magazine articles, film strips, movies, and literature of many kinds supporting soil and water conservation programs.

For example, movies have been produced: (1) Explaining how farmers and ranchers organize soil conservation districts and showing the results of good conservation practices; (2) highlighting the Mule Creek Pilot Watershed Protection Project in Mills County, Iowa; and (3) pointing out the opportunities for earthmoving contractors in the growing small-watershed protection and flood prevention movement, with scenes from the Upper Hocking Watershed project in Ohio.

Among other farm equipment manufacturers' activities, nine watershed models have traveled thousands of miles to hundreds of displays throughout the country during the past 4 years. These models, which portray a small watershed fully improved by a Public Law 566 project, have been used as educational displays for

local soil conservation district meetings, State and county fairs, organizational meetings of small-watershed associations, watershed congresses, television programs, dealers, and many other groups interested in conservation.

In the area of literature, the efforts of individual farm equipment manufacturers have been especially effective. Sample titles include "Making Paydirt Last," "Soil and Water Conservation Pays Dividends," "Stop Your Floods Before They Start," "New Opportunity in Soil and Water Conservation," and "The Soil Conservation Story."

Of course, farmers would never have achieved the present level of soil conservation unless the farm equipment industry had, in turn, concentrated on developing machines particularly adapted to the requirements of conservation farming. The need to meet these requirements, both in adaption of old equipment and also in development of new equipment, has been an ever-present guide for the design engineer.

One of the first major developments occurred when the moldboard plow took on a new look, which involved benefits for conservation. The moldboards were designed to do an improved job of cutting and rolling the soil more efficiently from the furrow onto the terrace ridge.

Perhaps one of the most significant developments in equipment, which permitted more effective conservation practices, was hydraulic lifting power for tractors.

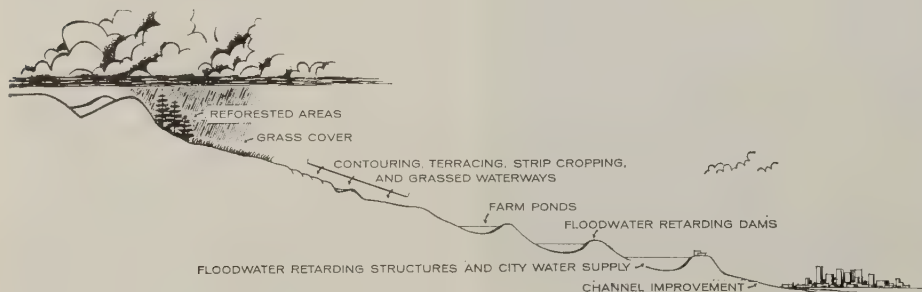


Diagram used in nationwide machinery company advertising brochure to explain small-watershed program.

Note:—The author is chairman of the soil and water conservation committee of the Farm Equipment Institute, and director of the marketing services and public relations division and a vice-president of the Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

Invests Heavily In and Water Conservation

For example, farmers now find it an easy matter, by means of simple controls, to lift a plow or disk in order to protect grassed waterways and other areas to be kept in vegetation.

Another innovation in equipment was the appearance last year of a commercial wheel track planter which permits farmers to practice minimum tillage or plow-plant technique. Benefits for conservation in this method are several. First, the number of field operations is reduced from an average of eight to three or four, thus gradually improving soil tilth. Second, this technique reduces water runoff and erosion, because the rough, loose soil left between the rows will absorb more moisture. In addition, yields are as high as or higher than those from conventional planting.

Another effective way that farm equipment manufacturers have supported conservation farming is through the Farm Equipment Institute. Headquartered in Chicago, the Institute is an association of several hundred farm equipment manufacturers and others associated with the industry—all dedicated to the advancement of agriculture and its prosperity.

The Soil and Water Conservation Committee of FEI has been the coordinating group which originates and develops both studies and action programs concerned with conservation. In these activities, FEI has cooperated with leading conservation agencies and associations to advance this common objective.

Working with the National Association of Soil and Water Conservation Districts, FEI has originated several conservation programs:

FEI-NASWCD newsletter contest: Dozens of soil conservation districts had been publishing newsletters for their members, telling their important story in a highly effective way. By making substantial awards to districts publishing the best newsletters, FEI believed it could encourage other districts to start publishing them and the existing ones to improve. Today, hundreds of districts submit their publications in the contest, which results in prizes for them in the form of a cash award and a plaque.

Movie: Another successful program culminated in the color sound film, "The Earth Is the Lord's." More than a thousand prints are now in circulation, with millions viewing the movie each year.

Press room for NASWCD convention: Each year, FEI has supplied a press room, manned by press officers from member companies, at the NASWCD convention. Together they provide news stories and articles for the major media—press, radio, and TV.

In addition, cooperating with



Ranch foreman examines special combination of blue panicum and buffelgrass that in a few months after root plowing and rangeland seeding replaced eroded, brush-infested land on Briscoe ranch.

the farm equipment dealers, local soil conservation districts, local and regional associations, and the National Retail Farm Equipment Association, FEI has conducted campaigns related to conservation. For example, the dealer-district program had as its primary objective to encourage all farm equipment dealers to work actively with their soil and water conservation districts.

This program was carried on for about 5 years. It was successful in getting the dealers to under-



Giant tractors on south Texas plains in one operation knock down brush with dozer blades, work the earth with root plows, and plant grass seed to restore the land to the cattle-producing rangeland it once was.

stand the districts' soil and water conservation program, and also contributed to getting more conservation on the land, particularly through wider use of machinery better adapted to applying conservation earthmoving and tillage measures.

During 1962, member companies of FEI, in cooperation with the Soil Conservation Service, also

have held five educational seminars throughout the country for SCS engineers in charge of the small watershed program. Plans are now under way for another, similar program, sponsored jointly by FEI, SCS, and the Land Improvement Contractors Association for their members.

In these and a host of other ways the farm equipment industry

has tried to communicate the message of conservation: "Wise management of land and water." These highlights illustrate the industry's abiding conviction that "rich and abundant though America's land may be, our natural resources must not be carelessly used, but we must replace what is taken away in the cycle of agricultural production."

Business Conservation Awards

Symbolize Farm-City Teamwork

By Curtis Loucks, Carl H. Zimmerman, and Guy Moorefield

FORMAL recognition of community betterment resulting from soil and water conservation farming has become a conventional practice by urban business and professional groups throughout the country. Several Great Plains and adjacent Cornbelt States provide representative examples.

In North Dakota's Pierce County Soil Conservation District, to name one, the townspeople of the county seat, Rugby—now acclaimed as the geographical center of the North American continent—each November turn their attention to an event which in that district ranks alongside with Thanksgiving and Christmas.

After 12 years, it is known simply as "The Smoker." It is the backdrop for a community scene in which the Chamber of Commerce, implement dealers, the two banks, and the district supervisors play supporting parts. A conservation farmer has the featured role.

Culminating the annual Soil

Conservation Achievement Com-



President Don Williams (l.) of Corning, Iowa, Rotary Club presents plaque to Chairman Ted Turner of Adams County SCD. David R. May (r.) is county Extension director and Rotary awards committee chairman.

petition, the smoker finds businessmen and farmers acknowledging each other's key contributions to the year's conservation progress. The implement dealers underwrite

the cost of advertising and promoting the event, and the banks arrange for a plaque presented to the winner.

The Chamber of Commerce and the district board share sponsorship and costs. Members of the Chamber serve the smorgasbord food. From 600 to 750 turn out for the "for-men-only" event, which includes entertainment and a speaker on an agricultural topic.

The farmer-winner and his wife also get an expense-paid trip to the annual convention of the North Dakota Association of Soil Conservation Districts, as do winners of similar competition in other North Dakota districts. Each receives an aerial color photo of his farm.

The conservation award program of the Corning, Iowa, Rotary Club is another typical example reflecting the way city people are concerned with farm problems such as soil and water conservation.

"The best project our club ever has undertaken," said Rotarian Floyd Whitmore, President of the Okey-Vernon National Bank of

Note:—The authors are, respectively, work unit conservationists, Ruby, N. Dak.; Helena, Mont.; and El Dorado, Kans., all of the Soil Conservation Service.

Corning, "is the one that recognizes farmers in Adams County for their accomplishments in soil and water conservation."

"The Rotary awards program creates an incentive for all farmers to become cooperators with the Adams County Soil Conservation District," explained Ted Turner, chairman of the district commissioners.

A farmer must be a district cooperator to be eligible. It all started back in 1954 when Fred McCard, manager of the Adams County Cooperative Electric and president of the Rotary Club, sold the other members on the idea. Seventy-eight farmers, representing every township in the county, have received awards.

Selections for the awards are made by a Rotary Club committee working with the district commissioners and Soil Conservation Service personnel. In a number of cases, the landlord-tenant relationships have been stressed with honors presented to both men.

Each honored farmer is presented a plaque by the club president, in an annual June program during Iowa Soil Conservation Week. Shown at the dinner are colored slides of each farm, taken by Rotarians Kenneth Roland, flying his own plane, and Glen Gillett as photographer.

Each year, the Des Moines Register and Tribune and Farm and Home Register sponsor a statewide Soil Conservation Achievement Award Program. In both 1960 and 1961, an Adams County Rotary Club winner was sweepstakes winner.

A major phase of the Butler County Soil Conservation District program in Kansas also has been aimed toward people not directly involved in agriculture. Foremost among the active urban supporters has been the Kansas Gas and Electric Company. Its officials recognize that the company's future depends upon progressive and prosperous communities. They



Cooperators of Butler County (Kans.) SCD recognized for having applied conservation plans to their farms and ranches.

are also aware that conservation of the soil is necessary in a predominantly agricultural community.

The company's conservation award banquet is an annual event in the district, at which district cooperators who have applied conservation plans on their land are recognized. Taking part are the district supervisors, gas company officials, press and radio, and others prominently identified with local soil and water conservation activities.

Highlight of the event is intro-

duction of the winning cooperators and the presentation to each of a metal Kansas Gas and Electric soil and water conservation sign. The red-and-white signs are a symbol of the completion of an important objective, and within a few days are decorating farmstead entrances all over the district. Many landowners and operators, seeing them, visit the company office or the Butler County District-Soil Conservation Service office to find out how they, too, can get one.



Rugby (N. Dak.) "chow line": Businessmen serving farmer guests.

Watershed Project Saves Cedar City Dollars

By Leland H. Carlson

THE Green's Lake Watershed Project in Utah is paying off for Cedar City and its residents.

It is estimated that without the project, the flash flood of September 8, 1961, alone would have caused damages to roads, houses, and other buildings in excess of \$8,300. As it was, the peak flood-flow of 600 cubic feet per second went through the debris basins and flood channel with no damage to Cedar City. Without the improved vegetative cover on the watershed, resulting from clearing, reseeding, and protection from grazing, there is no doubt that the peak-flow would have been of greater magnitude.

Studies and observations clearly show that all floods, such as the one of July 1956, which caused damages in excess of \$56,000 to driveways, retaining walls, streets, basements, household furnishings, sewerlines, and farmlands at Cedar City, originated on bare, or denuded, lands.

Planners of the Green's Lake Watershed Project saw the need of improving the vegetative cover on the watershed area above Cedar City, so that the life of the structural works of improvement would not be jeopardized. These land-treatment measures were included in the watershed project work plan: Airplane seeding, 1,359 acres; clearing juniper and seeding, 308 acres; plowing and seeding sage-covered areas, 143 acres; protection from grazing for 5 years, 1,667 acres.

All of this work has been com-

pleted. Sponsors of the project are pleased with the results, though they are not as good as the sponsors would like, because of a series of 6 dry years since the project started.

In order that the silt, mud, and rock flow into the works of improvement be kept to a minimum, the vegetative cover on the watershed must be improved gradually in the years to come. Research indicates that this improvement will come about more rapidly by light or moderate grazing than by total exclusion of livestock.

Soon after the 1956 flood, Soil Conservation Service technicians working with the Iron County Soil Conservation District established permanent study plots over the entire watershed, to determine results of various measures in im-

proving the vegetative cover.

They showed that the areas which were cleared of juniper and seeded to grass now have about a 60 percent cover of weeds, grasses, and forbs, compared to little or no ground cover where clearing of juniper was not performed.

The sagebrush-covered areas which were plowed and seeded also have responded well, and now have a fairly good grass cover. The oak-covered areas have not responded to the airplane seeding, but the native forage plants are increasing in the opening and under the more open stands of oak. Leaves from the oak and forage plants virtually eliminated runoff. Areas covered by aspens now have a scattered stand of grass under them; but it is far from adequate, though the aspen reproduction is increasing.

A study of the watershed after the 1961 flood showed that all of the runoff, which went into the basins and dikes, came from the juniper cover areas and other spots devoid of a vegetative ground cover.

Bill Thorley, vice-chairman of the Iron County district, observed he has known Green's Lake water-



When this plot was picked at random and cleared of juniper in 1957 for crested wheatgrass seeding, the only vegetation, under trees, was native penstemon, which allowed most of the water to run off.

Note:—The author is work unit conservationist, Soil Conservation Service, Cedar City, Utah.



By 1961, wheatgrass and other plants covered more than 60 percent of the grounds, and there was no water runoff from September storms.

shed since he was a small boy, and that it now has a better vegetative cover on it than he can remember. He also said that, at first, he was skeptical of the possible results of the juniper clearing and seeding. He said he is now convinced that instead of clearing 308 acres of juniper, double that amount should have been cleared.

Builders, public officials, homeowners, farmers, and others are so confident of the results of the Green's Lake Watershed Project in reducing the flood hazard to Cedar City that houses, schools, and other improvements costing in excess of \$2 million have been completed in Green's Lake flood plain. Other buildings costing more than \$750,000 million are under construction.

Nonfarmers Size Up Soil and Water Conservation

By William H. Atkinson

REPRESENTATIVE observers among the 90 percent of the United States population who are not farmers share with the landowners and operators today's prevailing high opinion of soil and water conservation farming methods. At least this conclusion is to be drawn from the observations of three thinking, professional members of the nonfarm population.

Ernest Wynkoop, a construction engineer now in charge of the Atomic Energy Commission's Project Gnome at Carlsbad, N. Mex., tells of his conservation experiences.

"The soil and water conservation program has a following far beyond just those engaged in agriculture. In my 40 years of ex-

perience in construction work, I found it impossible not to see, read, and 'rub elbows' with the soil and water conservation movement. Several years ago, I decided to leave the construction work and buy a cattle ranch near Fort Huachuca, Ariz.:

"As an engineer would turn to tables and books on strength of materials to build a bridge, I turned to the Soil Conservation Service people to build a ranch. Although I was not a cattleman by trade, my engineering experience showed me a similar need, or approach, to an overall plan on my ranch. Knowing that good technical conservation information was available, I went to the soil and water conservation technicians. With their assistance, I developed a conservation plan on my ranch.

With this conservation plan and my financial plan, I presented them to the principal bank in Phoenix, and asked for their opinion. The bank's opinion was that the plans were economically sound for a continuous ranch operation. I operated the ranch for a time, but the call of engineering construction was too strong, and here I am.

"If I should ever return to the farm or ranch I will know—as I knew last time—to seek assistance from the soil and water conservation people. Their good work is like a city built on a hill so all may see, and, in my opinion, many do see. The work I am in now has a very appropriate title, 'Operation Plowshare.' The art piece on my desk is of Moses beating a sword into a plowshare with these

Note:—The author is work unit conservationist, Soil Conservation Service, Carlsbad, N. Mex.



Ernest Wynkoop.



William W. Loos.



James R. Johnson.

words, taken from Isaiah 2:4: '... and they shall beat their swords into ploughshares.' A fitting emblem for both programs."

Another personal conservation experience is related by William W. Loos, principal of Carlsbad's new \$3 million high school:

"I am a part of the population not actually engaged in farming; but I have seen the soil and water conservation program since my youth, and I declare it 'good'. My father owns and operates a 1,000-acre farm near Sterling, Colo. I well remember the 'Dust Bowl' days in the thirties, and my father's applying conservation practices recommended by the Soil Conservation Service. I noticed that the soil on our farm did not blow and that the snow remained on our land and stayed white. Neighbors' snow was blown into drifts and then turned black with blowing topsoil.

"I soon left the farm and became a school teacher, but I never forgot my first observations in conservation. As I travel across this country of ours, or return to visit my parents, I can always tell where the landowners are practicing conservation. The country shows more progress, and life is more meaningful to the people. The towns are cleaner, more prosperous; school buildings are larger and better maintained; homes are

nicer and barns larger and more sturdy. There are more children in schools; more graduates in universities, and neighbors more neighborly.

"This can be recognized, regardless of what business a person may be in. My father has been honored as Colorado's 'Wheat King' and 'Master Seedman.' The soil and water conservation program which helped my father was partly responsible for these two honors. You can't hide the good of the conservation program under a bushel basket, because it is too big, and the fruit is too tasty even to us nontillers of the soil."

The third spontaneous report is from James R. Johnson, mining engineer and project engineer with Holmes and Narver, Inc.:

"Our company is prepared to design, engineer, and construct facilities ranging from offshore drilling platforms to nuclear reactors. In the past, the mining industry had set a poor conservation example with stripping operations, leaving acres of scarred and eroded ground behind. Mining companies now operate in the more populous areas where land has higher values than just as mining property. It has other uses, such as recreation, and as timbered areas. The mining companies cooperate whole-heartedly with conservation groups and seek their

assistance in reclaiming spoils areas.

"Several years ago, I was working at a rock quarry on an island off the coast of California. This island has rugged terrain and receives scant rainfall. Herds of goats and pigs roamed the island and were literally stripping the slopes of all vegetation. A watershed management program (one phase of conservation) was started under the direction of the island ranch manager, with the help of Soil Conservation Service technicians. Confinement of the goats and pigs by fencing, building of dams to control runoff, and seeding of native grasses on the bare slopes made a marked improvement during the 2½ years I was on the island.

"Now that I am living in Carlsbad, the importance of soil and water conservation is once again brought sharply into focus. It is an amazing sight to see the lush growth of irrigated areas surrounded by the open sand dune country. Certainly, good water usage and good range practices are of prime importance."



The average American today eats a third more beef each year than his father did 35 years ago.

Tailor Made—

Clothing and Conservation

By Gordon J. Price

FARMING for Idaho clothing merchant William Roper was a rough "eye-opener" into the big business of agriculture.

Bill often has said that "when I traded the Jerome store building for the farm in Idaho, I really got over my head in something I knew little about." He also has stores in Rupert, Twin Falls, Buhl, and Boise.

While the East Cassia Soil Conservation District still was in the organizational stage in Cassia County, Roper sought help of the Soil Conservation Service technician in the nearby Minidoka SCD in preparing a complete farm plan for his 640-acre farm.

While attending the 1956 convention of the Idaho Association of Soil Conservation Districts, Roper met the writer, who recently had been assigned to the newly organized East Cassia district. The upshot was that a topographic map and a soil survey were made and a conservation irrigation system was planned for the Roper farm. A land-leveling program was carried out from 1957 through 1959.

Roper's system included drop structures installed in newly prepared ditch pads for positive control of irrigation water, and concrete division boxes installed at all dividing points to provide for permanent control of irrigation water. Roper had two deep wells that pumped 5,274 gallons of water a minute. A 1,340-foot pipeline and a 735-foot open concrete ditch were

installed to carry water from the pumps down erodible slopes, along with two syphons to convey head-water under the large coulee and waste water under a head ditch and road.

Two ponds were built, in which waste water can be collected in overnight storage for further irrigation use.

Roper's hay and companion crop production increased in quality and quantity as each field was leveled, irrigation water controlled, and soil fertility improved. Roper now is able to plan and carry out his 7-year crop rotation: 1 year of grain with fall seeded grass-alfalfa, 3 years of hay production, and 3 years of annual crops.

He worked out a plan to grade and seed a large coulee to pasture, to give him 55 acres for grazing 100 head of cattle.



Roper's No. 1 well pumps 12-in. pipe full at 426 miner's inches, or 3,840 gallons a minute.

"That topographic map has a value of about \$7,000 to me," Roper says. "It's like having blueprints for a home one would propose to build. Everything is laid out, showing the needs of each acre as well as for each separate field. When I install a practice now, it fits and doesn't need to be changed or done over."

An irrigation trial was set up in the summer of 1962 for the Idaho soils found on the Roper farm. It will supply needed irrigation information on those soils for use as technical guides in other areas of Idaho soils in the State.



Field being leveled on Roper farm.

Note:—The author is work unit conservationist, Soil Conservation Service, Burley, Idaho.

Conservation Drains Spell End To "Town's" Old-fashioned Digging Bees

By Edward G. Konieczny

OLD fashion digging bees have gone out of style but the spirit of modern community-wide drainage maintenance still prevails in one Massachusetts "town." Here, cooperative drainage work in 4 different projects has made life simpler for 40 formerly drowned

out tobacco, onion, potato, and cucumber growers in Sunderland.

In addition to helping farmers, the group ditches have relieved such home problems as wet basements and plugged septic tanks.

The pioneer spirit first showed up in George Pomeroy, selectman and an onion producer who grew tired of being stuck with his farm



This wet, soggy land was of no value for crops, fish, or livestock use.



This cropland after conservation drainage improvement is producing nourishing vegetable food crops.



Selectmen Edward Steffin, George Pomeroy, and Edward Mieczkowski (l. to r.) of Sunderland, Mass., study a group-drainage ditch design prepared with the help of SCS technicians.

tractor. With other selectmen of the town of Sunderland, he aroused the interest of the people to request help of the Franklin Soil Conservation District in solving the problem. Soil Conservation Service technicians working with the district attacked the problem with soil augers, survey instruments, and sharpened pencils. Voting the traditional town meeting way, the townspeople approved the ditch plans with financial help for one-half of the cost.

"It sure beat the old hand digging days," said John Benjamin, local contractor who was awarded one of the dragline digging jobs.

The "old days" he mentioned were the community hand digging bees when all the farmers that owned land along the ditch would get together each year to dig out their drains. Because the land is flat, they often dug 2 to 3 miles to outlet the water.

"The first drain worked so well that we had to set priorities—dig-

Note:—The author is soil conservationist, Soil Conservation Service, Greenfield, Mass.

ging a little each year," Pomeroy recalled.

During the last 8 years, town voters have approved more than 5 miles of drainage ditches.

Today, while farmers in other towns up and down the Connecticut Valley slush around in boots, those in Sunderland operate serenely on firm and dry fields. Instead of holding the old fashioned digging bees, the landowners

and their children are content to fish in lagoons and streams alongside the drains in the same waters that once mired horses and tractors. Removal of excess water on 100 acres of land has brought higher quality tobacco, potatoes, cucumbers, and other vegetables.

Edward and Walter Storozuk, dairy farmers, said their 40 milk cows eat more grass and produce creamier milk.

"I haven't used my cellar sump pump once since the ditch was put in," stated Steve Kroll, one of the town's homeowners who have benefited from the drainage ditches. "The ground water has been lowered, so I also don't need to clean out my septic tank as often."

The town also has made provisions to keep the drains functioning, by hiring a dragline to clean out the silt every 5 or 6 years.

D. C. Metropolitan Small-Watershed Project

Maryland's Montgomery County Council, the Montgomery Soil Conservation District and the Maryland-National Capital Park and Planning Commission are sponsors of a proposed Upper Rock Creek Watershed Project to benefit the District of Columbia and adjacent Maryland metropolitan area.

Drafting a plan for the project climaxed 7 years' effort by private and public agencies and organizations interested in rural-urban planning, soil and water conservation, and recreation. It is the first metropolitan area Watershed Protection and Flood Prevention Act work plan providing for a cooperative undertaking between the Department of Agriculture, urban and rural groups, and a park and planning commission.

Estimated total cost of the project, scheduled to be completed over a 5-year period, is \$2,128,386—\$1,208,196 Federal share and \$920,190 local share.

The project would alleviate frequent flooding of park facilities, damage to flood-plain utilities, and erosion and sediment damages accelerated by subdivision developments. The land treatment and dams would reduce floodwater damages by 62 percent and reduce the sediment load transported to the Potomac River in the District of Columbia by 51 percent.

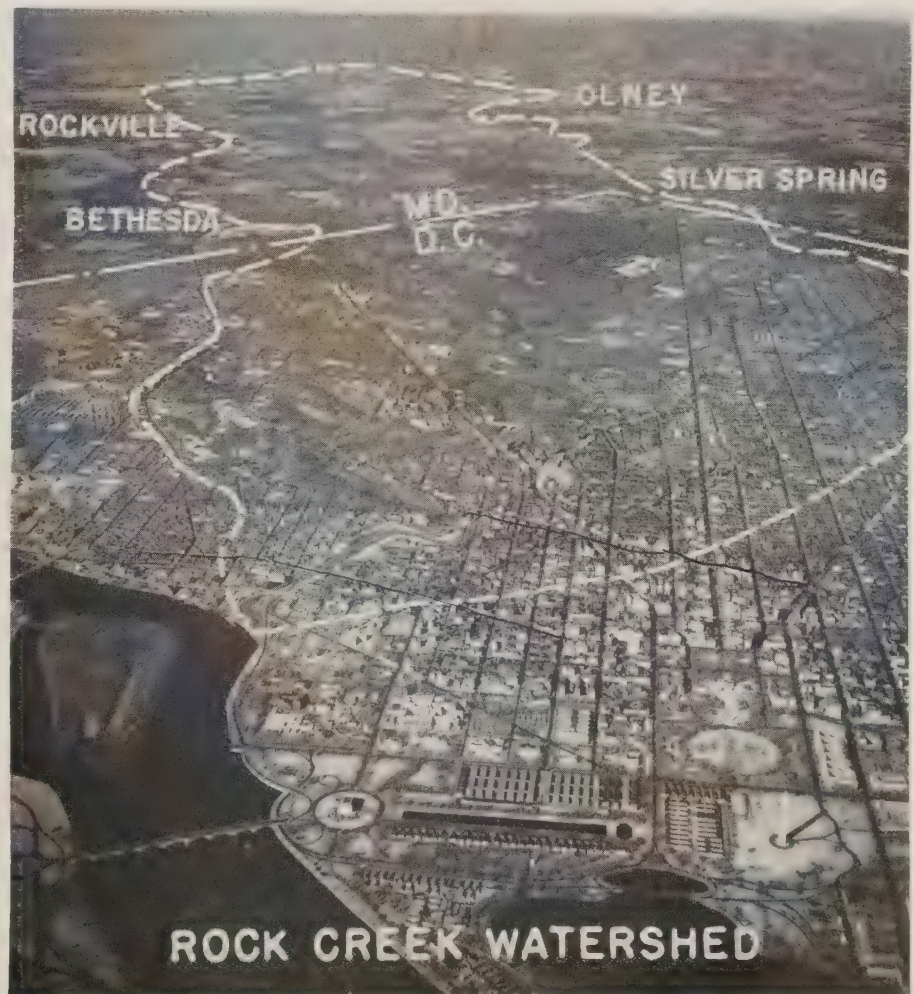
Because most of the watershed (38,765 acres or 78 percent) is in Montgomery County, no works of improvement, such as soil and

water conservation treatment and two multipurpose dams, are planned within the District.

The Soil Conservation Service, which administers the Watershed Act for the U. S. Department of Agriculture, would provide technical help for land treatment and the Federal share of the cost of construction and installation serv-

ices.

Rock Creek rises in the low hills of Montgomery County about 20 miles north of Washington. The midsection is largely covered by suburban residential areas, many of them developed during the last decade. The lower portion embraces a substantial residential section of the District of Columbia.



AGRICULTURE AND BUSINESS

The American farmer stands today at a major crossroads, and you (businessmen)—believe me—stand there with him. . . .

We have a way of talking about “farm” interest and “city” interests as if the two communities were a million light years apart. When the businessman thinks of the farm, it is apt to be in terms of an irritating and expensive situation that concerns an insignificant 8 percent of the population, somewhere “out there.” This is an illusion I wish we could dispel.

It is easy to underestimate the farm population. There are fewer than 15 million people living on farms today—about 8 percent of the country’s population—or about the same as the population of the New York metropolitan area. Would anyone suggest that the New York area is not vitally important to the national economy? The influence of this metropolis is felt from one end of the country to the other and around the globe.

In the same way, the importance of agriculture to the economy is far greater than the farm population alone would indicate. Remember that farmers and their families

are only one part of the agricultural population. There are another 40 million people who make up our rural population, and a large number of them are the small town families who service and supply the farm communities.

Ten million people have jobs storing, transporting, processing, and merchandising the products of agriculture. Six million people have jobs providing the supplies farmers use. Add them all up—the farmers, the small town shopkeepers and bankers, the truckers, processors, wholesalers, and retailers—and the “agricultural” population is far closer to 40 than to 8 percent of the Nation. . . .

The investment in agriculture was over 200 billion dollars in 1961. That’s about *three-fourths* of the value of current assets for *all* corporations in the country. It is *three-fifths* of the market value of all corporation stocks on the New York Stock Exchange. That is big business indeed.

The investment in agriculture represents \$21,300 for each farmworker. In manufacturing it is less than \$16,000 for each worker. Farmers sent more than \$20 billion

worth of food to the domestic market in 1961. By the time we paid for it, it was worth another \$40 billion—twice again as much. About half of that money was wages for the men and women who process, store, ship, and finally sell our food to us in the store. This marketing bill was income to the trucking and rail companies that hauled the food. It was profits for the companies handling farm foods. And they in turn, bought containers and fuel, paid rents, interests, and taxes, until the dollars that started on the farm had been multiplied over and over throughout the economy.

Selling to the farmer is measured in billions of dollars. . . . Last year, for instance, the farmer grossed nearly \$40 billion—\$35 billion from his crops and livestock. He paid nearly \$27 billion for everything he needed to run his business.

The farmer puts out about \$2.5 billion a year for the purchase of trucks and tractors and other machines and equipment. About \$1 billion is spent by the primary iron and steel industry for equipment and new plants. He spends \$3.4 billion for fuel, lubricants, and maintenance for his equipment. Farming uses more petroleum than any other single industry. And to keep his farm going, the farmer uses 27 billion kilowatts of electricity—enough to run Baltimore, Chicago, Boston, Detroit, Houston, and Washington, D. C., for a year.

And while you think about the farmer, don’t overlook his wife. She’s spending money, too—about \$12.7 billion of realized net income last year.

It would be hard to find a more important customer and business partner than the farm family.

—Excerpts from address by Secretary of Agriculture Orville L. Freeman before the Sales Executive Club of New York, March 27, 1962.



To build a parallel terrace like this one a farmer has to have earthmoving equipment, which requires fuel and labor to operate it. Soil conservation district farmers have built 1½ million miles of terraces.

Michigan City and Farm Interests Join Hands In Watershed—Recreation—Wildlife Developments

By Ralph W. Lowery

SOUTH central Michigan farm and city interests have gone all out in promoting better community living through conservation developments. And they're getting results!

For one thing, the Calhoun Soil Conservation District during the past 2 years has shouldered leadership in many significant conservation activities carried out by Battle Creek and neighboring city dwellers and farm people in developing wildlife improvement projects, resource needs, soil surveys for planning commissions, new highway programing, youth recreational and education field days, and day camp nature studies—all on a small-watershed basis.

Thus the Battle Creek Kiwanis Club has bought 120 acres of idle land on Achley Creek in the Kalamazoo Valley watershed, in order to improve it for waterfowl and upland game. The Michigan Audubon Society, which owns 561 adjoining acres, joined hands with the Kiwanis Club in building a retention dam storing water on 250 acres of once-farmed marshland, with flood storage available on 300 additional acres. Grasses and legumes, shrubs, and food plots have been planted for cover and food for upland game and for waterfowl nesting habitat. All together, there is a 3,500-acre watershed area, in which 50 percent of the land has a conservation plan.

These two organizations have dedicated their holdings for the education of city and farm youth in conservation of natural resources and recreation uses. They are cooperating with the Calhoun

district, and have received technical help from the Soil Conservation Service and from the Game Division of the Michigan Department of Conservation.

The interest of city and farm people here cover one-half of the land area of the Calhoun County, with four-fifths of its population involved.

In May 1962, the Extension Service specialist sponsored a field day for the Marshall, Battle Creek, and Bellview 5th graders, during which 350 youngsters studied wildlife water, food, and cover developments. Day-camp nature classes were held in June, July, and August for 8- to 12-year-olds of Marshall and Battle Creek. The Michigan Audubon Society provided instructors. The Nottawa Trail Boy Scout Council held its jamboree in September, with 800 scouts camping and learning about wildlife and watershed improvement projects. These young people will continue to use and to be trained at the watershed project

by city people going to the farm.

Out of this undertaking was born the idea of forming the Kalamazoo Valley Resource Council, Inc., to study and take inventory of the natural resource needs of the valley. This is a nonprofit organization, to bring together interested people of industry, city, farm, institutions, and others to study total soil and water, wildlife, and recreation needs and potentials of the valley, which consists of half a million acres, of which 143,000 lies in Calhoun County. The main purpose of the Council is to motivate the interest of the people, and to promote attention to and action on the total soil and water needs of the watershed for the people.

Another important development came when the Athens Village asked the farm people along Pine Creek, a branch of the Nottawa River, to cooperate in studying the opportunities for improving 1,000 acres of marsh for recreation and wildlife developments. This



250-acre marsh development in Kiwanis-Audubon area.

Note:—The author is work unit conservationist, Soil Conservation Service, Marshall, Mich.

If your address changes, please notify us of your complete new address, including zone or RFD number, and include old address with our code number as shown above.

group has asked the Calhoun district to cosponsor a watershed project of the Nottawa River.

The district invited the technical review committee of the Michigan State Soil Conservation Committee to review this watershed for Public Law 566 approval; the committee approved and now the people are pushing for a Public Law 566 application. The upper Nottawa has drainage and erosion problems, and a need for coordinating river and county drain outlets with new Highway I-69 to be built in 1965. The Nottawa River includes 94,000 acres in Calhoun County.

Because of the interest shown by the Battle Creek Kiwanis Club, the Audubon Society of Michigan, the Athens community planning group, the Battle Creek Planning Commission, and the Marshall and Albion planning commissions, the boards of supervisors of 10 townships in these two watersheds asked for complete soil conservation surveys. Surveys in nine townships have been completed and are in the hands of township boards, planning commissions, boards of health, and others concerned. The soil survey maps are important guides for future land-use changes, septic tank field and highway locations, and new suburban developments.

Meanwhile, the Extension Service is leading out with education programs on land-use analyses, population trends, zoning needs,

and planning commission organization. Soils information is being superimposed on the present land-use studies; and facts developed in the recently completed National



Studying plan for Kiwanis and Audubon area (l. to r.): R. D. Van Dusen, biologist and member of both organizations; Kenneth Krum, chairman Kiwanis Agricultural Committee; Martin C. Urka, SCS; Burr Ambre of Kiwanis Club; and N. D. Ismond of Michigan Department of Conservation.

Soil and Water Conservation Needs Inventory are being incorporated in the overall planning program.

The Kalamazoo Valley is expected to have 2 million more people by 1980 or 2000. Today's inventories of soil and water, industrial, wildlife, and recreation needs are aimed at having recreation areas set aside, water resources developed and kept free from contamination, parks located, wildlife habitat improved, and well-water kept pure.

New Metropolitan Planning Course

Increasing metropolitan pressures on the land and other facilities in the national capital area led the Northern Virginia Center School of General Studies to offer a new course this fall on "Introduction To Community Planning."

The Arlington County school, an extension of the University of Virginia, explained in introducing the course:

"Our exploding metropolis poses a challenge to effective planning which must be met if our community of tomorrow is to attain the inherent promise of the future. In cooperation with the Washington Center for Metropolitan Studies, and with planning agencies and civic groups in northern Virginia, we are pleased to introduce this survey course. It is intended primarily for the interested citizen or the civic leader who wants a better understanding of the principles of planning, the role of citizens, groups, and public agencies in the planning process."

Offered for undergraduate credit, the course—with emphasis on northern Virginia in relationship to the Washington metropolis—is taught by Miss Mary Small of the Washington, D. C., National Capital Planning Commission staff.

DECEMBER 1962

Soil Conservation





Growth Through Agricultural Progress

Soil Conservation 25 Years Ago

"White Eyes Valley is small, yet the spread of strip cropping into the hill country is typical of the growth of this soil-saving practice in rolling Ohio. County agents have their hands full answering questions and requests. Farmers who have adopted it say they would not go back to the old-style farming for two thousand dollars."

"Protecting eroding areas by the use of natural vegetation is not land retirement; it is the rededication of the land to the production of the crops for which it is best adapted. A gully controlled by natural vegetation may produce profitable crops of timber and farm wildlife; a steep slope, naturally vegetated, may, with the exercise of a little caution against overgrazing, be made to furnish economic crops of pasture or prairie hay."

"... there is more gold in the roots of the grass than has yet been found in the ledges or veins beneath the surface (east of Sacramento, Calif.)."



COVER PICTURE — "Conservation Pays"—as illustrated in this view of the Ivan Morris farm plant in its setting of contour stripcropping and farm pond (r. center) in Fairfield County, Ohio.

—Photo by E. W. Cole.

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Soil Conservation

ORVILLE L. FREEMAN
Secretary of Agriculture

DONALD A. WILLIAMS
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FRANK B. HARPER, Editor

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Bigger Profits Spur To Conservation Farming

By Carroll H. Dwyer

CONSERVATION farming has come into the widespread use it enjoys today first of all because it pays.

I have asked many soil conservation district cooperators just why they were becoming conservation farmers. Their answers have covered a wide range of reasons, but when analyzed almost every one had one basic concept: In their opinion, it was a more profitable way of farming. That one fact is the key to why the great amount of conservation farming is practiced—it's a more profitable way of farming.

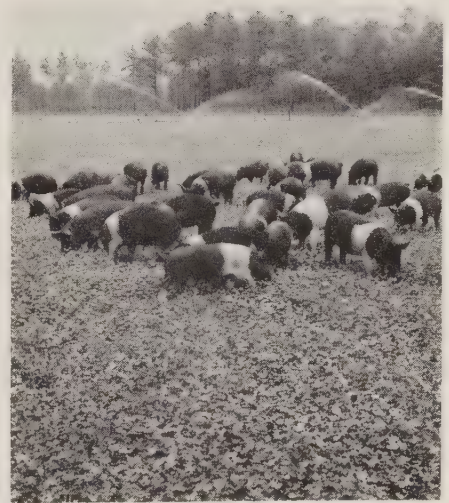
True enough, they may not have started a conservation plan for that reason. They may be true conservationists at heart and would follow conservation regardless, but there are few who can afford to be in this class. And few farmers who

became conservation farmers simply because it was the popular thing to do have stayed conservation farmers very long unless they were convinced that it was more profitable.

The profit motive may be expressed in a variety of ways—as the means of conserving soil or water resources, as savings of time or equipment, as an increase in crop yields, or as reduced operating expenses. Basically, however, each type of benefit may be reduced to dollar terms—terms which we can all understand and appreciate.

We know that every farm operation or practice, regardless of what it is, must meet two tests if it is to continue. It must be physically feasible, and it must be economically feasible. Conservation practices are no exception.

Unfortunately perhaps, there is



60 shoats grazing 3 acres of irrigated ladino clover that provided no pasture 30 days earlier without water. Operator W. C. Hollowell near Greenville, N. C., figured a daily saving of 4 to 6 bushels in corn fed.

no stock answer or quick rule of thumb to give a categorical answer as to whether a conservation practice or measure is economically feasible. Each farm presents different conditions which must be understood before we are able to advise what the economic impact will be.

Suppose, for example, a soil conservation district cooperator who was a truck crop grower has some lower lying land which floods periodically and has a high water table. Best conservation use of this land might be achieved by installing a shallow surface drain to remove standing floodwaters quickly. The field could then be seeded to an adaptable high-yielding pasture grass.

This improvement, however, would be of little, if any, value to



Conservation on the land near Dayton, Wash.

Note.—The author is soil conservationist, Farm and Ranch Planning Division, Soil Conservation Service, Washington, D. C.

the truck crop grower. He probably would not have livestock to use the pasture. If he rented the pasture he would have to fence it. Therefore, it may be a physically feasible conservation improvement, but for the truck crop operator it is not economically feasible. On the other hand, if the landowner were a dairyman, the improvement might be highly profitable.

Age of the operator may be another deciding factor. A younger man may be willing to make conservation improvements which may actually show a loss in income for a short time, but which will result in long-term benefits. An older operator might not be willing to make the improvement unless its benefits were realized immediately.

In considering conservation improvements, or any other change in method of operation, there are two major questions: (1) What will the cost be, and how long will it take to repay that cost? (2) What effect will the change have on the system of farming, on yields, and on net farm income?

Half a dozen questions, each having a bearing on the major questions, also need to be considered by the prospective conservation farm-

er or rancher:

(1) Will his present machinery be adequate or will he need additional or specialized equipment? (2) What effect will the change have on his labor requirements, both as to quantity and timing? (3) Will he have a market for the crops to be grown, either in the market place or through livestock? (4) Will a single change or practice give the desired benefit, or are additional changes or practices necessary? (5) Will these changes require additional capital for fences, buildings, livestock, or special equipment? (6) Will he have adequate capital resources or sources of satisfactory credit to make effective use of his improvements?

It has been found that in almost every instance where an individual has been disappointed in his conservation program he had failed to consider one or more of these questions. The Soil Conservation Service has developed a technique by which it can help in providing information on most of the questions. This information, together with the operator's knowledge of his farm, should give him adequate information to reach sound decisions

on his conservation program.

Once basic cost of production data are available for the crops produced, along with physical data such as are required for developing a conservation plan in any event, economic analyses can be made in a matter of a few minutes.

Uncounted experiences and special studies have confirmed that conservation farming is indeed profitable. For example, a 5-year study by Washington State College and the Soil Conservation Service in the Palouse area conclusively showed that conservation farmed units returned 38.8 percent more net income an acre than did farms farmed in the regular manner. This amounted to \$8.31 an acre a year.

Elsewhere, it also has been found that for each dollar invested in conservation practices, the rate of return has been from 30 to 60 percent interest a year for a number of years.

Such profitable benefits are repeated wherever conservation farming is practiced. They add up to the fact that proper use of soil and water conservation measures is a more profitable way of farming. In addition to being more profitable, it also is a means of maintaining or improving these and related resources so that our community, State, and Nation each is a stronger and more enjoyable place to live.



Outdoor recreation is becoming a marketable "crop" for farmers in many areas. Publicly provided recreation facilities cannot keep up with the booming demand. The demand can be met on privately owned lands—farms, ranches, and woodlands that make up nearly three-fourths of our land area. Much of this land is near population centers. Some farmers have opened hills to skiers and installed ski tows. Many have taken in summer vacationers or provided camping or hunting areas. Others have farm ponds or reservoirs for fishing, boating, and swimming.



Stubble cutter operating in Walla Walla SCD in Washington's Palouse. Stubble increases moisture going into soil.



J. W. Cross.



Author with J. W. Cross' burley tobacco on Class I land in mid-July.

CONSERVATION made it possible for J. W. Cross and Sons of Hickory Point to change their 650-acre corn-wheat-tobacco farm to one of the outstanding livestock operations in upper middle Tennessee. They figure the change-over has stabilized and increased their income by at least 35 percent.

The Cross program was developed through the Montgomery Soil Conservation District according to a conservation plan developed with the help of the Soil Conservation Service. Cross Senior has been chairman of the Montgomery district for the past 17 years, and was the first farmer in the district to work out a conservation plan. He also is past secretary-treasurer and

Note:—The author is work unit conservationist, Soil Conservation Service, Clarksville, Tenn.

Pasture and Livestock

Boost Farm's Income a Third

By Lester Solomon

vice-president of the Tennessee Association of Soil Conservation Districts and chairman of the State Agricultural Conservation Program Committee.

The soil with which the Crosses work is mostly red, rolling cherty land with some hardpan soils on the more level areas. The upland areas erode easily. Only about 25 acres of the farm is Class I land, suitable for intensive cultivation.

As a result of changing from row crops to grass and other feed crops, the Crosses now are able to run 96 head of polled Hereford brood cows and 4 herd bulls, plus calves. They are kept in tiptop shape for marketing at the best possible prices by a feeding program made up chiefly of high-quality roughage.

The cattle graze almost year-

round on more than 450 acres of permanent, fertilized pastures.

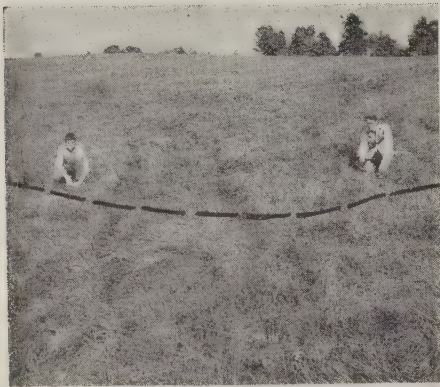
"The pasture must be considered as a crop, just like corn, tobacco, or soybeans," J. W. Cross said, "and this means adequate fertilization and careful management."

About 250 tons of corn and cane silage is fed to the brood cows each year, plus hay harvested from extra spring growth of pastures. Oats, grown on Class I and II land in rotation with the silage crops, and sericea also are used for hay. Average silage yield is 16 to 20 tons an acre.

Basic pasture plants grown are orchardgrass, fescue, and ladino clover. Sericea is kept clipped to give tender new growth for summer grazing, along with Kobe and Korean lespedeza. A fescue-blue-



5-year-old pasture of fescue, orchardgrass, and ladino clover.



Wayne Cross (r.) shows how the natural draws on farm are seeded and maintained as sod waterways.

grass-ladino pasture is reserved for winter grazing.

Seed production is a profitable sideline to the Crosses' livestock operation. Last year they harvested about 10,000 pounds of orchardgrass seed, 4,000 pounds of fescue, and 2,000 pounds of sericea.

The Cross conservation program has been intensively applied. Nearly all idle, eroded, or grownup land has been cleared, smoothed, and established to pasture.

Three ponds were built to serve pastures not otherwise supplied

with stockwater. All fields cropped in the past have been terraced, with regular farm machinery by a method referred to by other farmers adopting it as the "J. W. Cross Method." Sod waterways have been established in virtually every draw on the Cross land.

With the senior Cross' increasing civic activities, his son Wayne has assumed more and more responsibility for operating the farm, of which only about 5 percent is in row crops.

Banker "Wouldn't Lend a Red Cent"—

Land Now Worth Hundreds of Dollars an Acre

By L. Bard Blackham

FROM land that his banker said he "wouldn't lend a red cent on" 30 years ago George H. Seegmiller has developed a farm near St. George in Utah that today is worth several hundred dollars an acre.

Seegmiller started back then with 70 acres of saltgrass and swampland in the Virgin River

Valley that grew no crops and supported only 18 to 20 head of cattle during the summer—or about one-fourth animal an acre. This year he grazes 435 head on 110 acres of irrigated and fertilized rotation pasture, including much of the original 70 acres. He gets about 8 months' pasture, supplemented by only a little dry alfalfa hay. The animals' gains average 1 to 1½ pounds a day.

A staunch conservationist, he started developing his land before there were any organized agencies in the area to give him technical assistance. When he bought the original 70 acres, he couldn't ride horseback over parts of it, because it was so swampy and grown up in reeds. Even with irrigation water on the land, only about 15 acres ever got wet—and this produced only saltgrass and reeds.

"It didn't take long to see the land would never be profitable in that condition," Seegmiller recalls. "In the beginning, I even raised strawberry clover seed in my garden in St. George to plant on that

farm."

The clover did well and provided cover for the land. Gradually, he expanded his program and bought saltgrass land adjacent to his farm.

When the Soil Conservation Service established an office in St. George, Seegmiller was one of the first to seek technical advice and assistance. Following recommendation of technicians, he drained his land, plowed up the saltgrass, and leveled the ground. He obtained various grass seeds from the Dixie Soil Conservation District, of which he was to become chairman, and found that tall wheatgrass did best on his salty land.

This grass was left in for 5 years after planting, to build up this type land, during which time he made about \$100 an acre from the sale of grass seed, in addition to pasturing about one cow to the acre each year. After the 5 years, there were no bare spots on his land, and it was ready for other crops. As each



This pasture Seegmiller is examining—smooth brome grass, orchardgrass, alta fescue, and ladino clover—has 16 times its original carrying capacity.

Note.—The author is work unit conservationist, Soil Conservation Service, St. George, Utah.



Part of cattle herd grazing on 110-acre irrigated pasture.

piece of land reached the end of its 5-year program, Seegmiller chopped up the grass and sod in the fall, plowed it under, and planted other crops the next spring, such as oats, barley, alfalfa, and better grasses.

He now has land planted to orchardgrass, smooth brome, red clover, fescue, ladino clover, strawberry clover, and alfalfa, and says they all do well. He gets five cuttings of alfalfa every year, with a yield of 6 tons an acre. In addition,

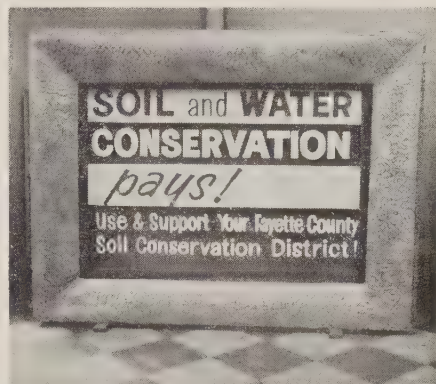
he raises wheat, barley, oats, and grain and forage sorghums and says yields are comparable with those anywhere in the valley. He was unable to raise any grain crops at all on these lands until his conservation program went into effect.

Through the years, he has improved some 200 acres, and today his farm consists of 350 acres, some of the best of which once was part of the old "saltgrass" country. Water that in the beginning irrigated only 15 acres, now irrigates 150

acres efficiently. He picks up the tail water from each field, stores it in a pond for later use on another, or irrigates other lands directly. He also picks up tail water from surrounding farms and stores it in reservoirs for later use. In fact, he just about "wears the water out" by the time he is through with it.

In addition to his farming interests, Seegmiller for many years also has been a successful rancher on the Arizona strip.

He says he figures his cash outlay in the land-improvement program would average about \$75 to \$100 an acre, including total cost of draining and leveling and constructing concrete irrigation ditches. He drained 285 acres with $2\frac{1}{4}$ miles of open drains, leveled 350 acres, put in 11,074 linear feet of concrete ditches, built 2 overnight storage ponds, and installed 1,310 small structures in his irrigation system.



This sign is used in Fayette County, Pa., in many public buildings and on special occasions.

"Our aim," says Mrs. Jacob Cover, Secretary and Treasurer, "is to keep the public aware of the work being accomplished by using every possible opportunity to present 'Conservation Pays!'"

(She also reports that all of the district directors subscribe to *SOIL CONSERVATION* as well as having the magazine sent to local public libraries and Vo-Ag teachers—Ed.).



Seegmiller has sold as much as \$100 an acre of seed from this tall wheatgrass grown during 5-year leaching period before planting improved permanent pasture grasses on land drained, leveled, and planted at cost of \$80 to \$100 an acre.

American Tree Farm System

Major Conservation Movement

By J. C. McClellan

THE words "tree farming" have a long history, but the first forest to be formally called a "tree farm" dates back to June 1941. That was when the Weyerhaeuser Company, believing man must assist Nature in renewing the forest by actively tree farming, proclaimed a 129,000-acre forest tract in the State of Washington as the "Clemons Tree Farm."

In November the same year the American Tree Farm System as a member of the Nation's resource conservation team was formally adopted by the National Lumber Manufacturers Association, and broad standards were set, though the first tree farms were not formally certified until April 1942, in Alabama.

It was during this same time that the conservation of soil, water, grass and timber lands, and wildlife was coming into wide-scale recognition and practice. This was through (1) soil erosion con-

trol demonstration projects; (2) through U. S. Forest Service, Soil Conservation Service, and other Civilian Conservation Corps camps; and (3) through soil conservation districts which farmers formed under State enabling laws.

One of the camps was at Snohomish, Wash., where farmers in the pioneering local Washington Forest Products Cooperative Marketing Association were to be among the first individual small-woodland owners to become certified "tree farmers." In another SCS camp area, at Montesano, Wash., the new voluntary tree-farming movement likewise received enthusiastic acceptance.

The tree farm system now has become a major conservation movement in America, winning the respect of forest industry representatives, conservationists, and farmers throughout the land.

Now in its 21st year, the system has enrolled almost 24,000 tree

farmers in 47 States, with a total acreage of nearly 60 million acres of forest and farm woodlands. About 3,000 tree farms and 3 million acres of forest are added each year. The objective is to encourage all private forest landowners to:

(1) Protect their woods from fire, insects, diseases, and harmful grazing; (2) harvest in a manner that insures repeated forest crops; and (3) plant idle acres to trees.

Tree farming is a genuine conservation practice because of the resulting multiple benefits. The soil is protected, because cutover areas are promptly reforested after logging is completed, or logging is selective to encourage Nature to reforest an area. Disturbance of the soil during logging is kept to a minimum.

With trees on the land, we are assured a constant flow of fresh water, because rain or snow water drains slowly into the streams and is made available for our everyday needs. Wildlife benefits, because harvesting trees encourages new growth of plant life, especially the important "forest edge" for food and cover. Recreation opportunities are created as forests are established and renewed, because people love to go into the woods and relax and play.

Tree farmers know there is money in growing wood crops. Forest industries are popping up all across the country with huge appetites for pulpwood, veneer logs, sawlogs, poles, and other timber products like naval stores



The O. K. Smith farm near Hayden Lake, Idaho, combines cattle ranching and tree farming.

Note:—The author is chief forester, American Forest Products Industries, Inc., Washington, D. C.



Tree Farmer Hugh W. Alger of Towanda, Pa., proudly nails up his sign to tell neighbors he is managing his woodlands wisely for production of future crops.

gum, and Christmas trees more than 5,000 different kinds of wood products Americans need and use,

Tree farms vary in size from private commercial forest holdings of thousands of acres to farmers' small woodlots. The American

Tree Farm System is administered nationally by American Forest Products Industries, which took over from the National Lumber Manufacturers Association in 1946. State forest industry committees administer the program through State tree farm committees; while the associations operate through State or regional tree farm or forest practice committees.

Forest industries, as the ultimate sponsors of the tree farm system, are, of course, primarily interested in assuring themselves a steady supply of timber; but they also practice multiple-use conservation. More than 2,000 foresters—many from State government conservation agencies but most from the forest industries themselves—serve as inspecting foresters to assure sound forest management. In deciding whether to certify a woodlot as a tree farm, the State tree farm committee is guided by the findings of the in-

specting forester.

The American Tree Farm movement has been closely identified with the country's soil and water conservation effort since the movement's start. For example, the head of American Forest Products Industries, Inc., Charles A. Gillett, as a State forester in Arkansas, helped prepare the enabling legislation for soil conservation districts in that State—the first such legislation enacted in the Nation. He later served on the Arkansas State soil conservation committee, the first one in the country.

Many conservationists, meanwhile, have found that the American Tree Farm System is actually another tool in their conservation kit to assure the continued planning and application of conservation practices, particularly in soil conservation districts, where virtually all of today's and tomorrow's "tree farmers" are to be found.

Grass-Water Conservation

Brings Idaho Farmer Results

By Donald N. Davison

CONSERVATION farming helps Grove Phelps of Bennington grow most of the hay and feed he needs for his livestock and thereby boost the profitableness of his diversified Idaho farm-ranch operation. It includes raising sheep and beef cattle and operating a small dairy herd.

His setup includes 1,860 acres of range—1,180 of it Taylor grazing and State lands—and 752 of cropland. Phelps—Bear Lake County's 1961 "Grassman of the Year"—

has a forest permit for two bands of sheep, but grazes only one band, thus assuring excellent pasture conditions. Similarly, only half of the private and leased range is grazed each spring, as part of a rotation system to insure sustained range operation. His conservation system includes watering and salting facilities on the rangelands for better grazing distribution.

"No operation can be successful without some planning," Phelps says of his plan worked out with the help of the Soil Conservation Service, "but a farmer has to be

ready to change his plans as conditions and times dictate. We farmers need to keep up with new technologies, improved varieties, and better farming methods."

The Bear Lake Soil Conservation District cooperator runs 1,250 head of Rambouillet ewes, 12 milk cows, and 85 head of Hereford breeding cows. His calf crop has been averaging 95 percent and lambing 135 percent. Calves and lambs are sold to local buyers.

Cropland is the key to the success of the overall operation. Phelps' plan consists of 4 to 5 years of

Note.—The author is work unit conservationist, Soil Conservation Service, Montpelier, Idaho.



Phelps and sons Allyn (l.) and Marden have reason enough to smile while examining rank irrigated grass-alfalfa stand.

alfalfa followed by 2 years of grain before reseeding to alfalfa. He uses brome grass in his mixture, and a lightly seeded grain nurse crop. He grows mostly barley and some oats for feed. Phelps spreads

barnyard manure on his land and also uses fertilizer. Average yields of barley have been about 75 bushels, and his hayland yields about 4 tons of good quality hay an acre. In 1961, Phelps harvested 200 tons of high-quality alfalfa hay from the first cutting alone on one 80-acre field.

There are 35 acres of native grassland on the farm and 35 acres of grassland reseeded to alfalfa and brome grass. This pastureland originally was wet meadows. In 1954 and 1956, Phelps installed 4,600 feet of tile drain, and an overnight storage reservoir for sprinkler irrigation. The rest of the drainage water was applied to land leveled for border irrigation.

Phelps estimates that in normal years the flow from the tile drains average about 1 cubic foot per second. This extra water, added to shares from the Bennington Irrigation Company, is usually enough for his irrigation needs. One gravelly, shallow 20-acre field formerly required four times as much water to irrigate by flooding as is now required by the sprinkler system.

"My drains and sprinkler system have paid for themselves several times over on this type of land," Phelps says. "I had too much water on part of the farm and not enough on the rest."

Phelps is president of the Bennington Irrigation Company and recently, with the assistance of the soil conservation district and some Agricultural Conservation Program aid, started construction of a mile-long pipeline to conserve water in a leaking ditch.

Phelps also plans to utilize some of his neighbors' waste water which crosses his land and creates a wet situation, by piping it about a quarter of a mile into a sump pit to be used in his sprinkler system. He likewise is considering drilling a well to irrigate 100 acres of dryland, several miles from the main farm, to produce hay and related livestock crops.



But they had little cause to smile about this poor hay stand on land not properly prepared for irrigation.

Arkansas Farmer's Conservation Money-makers

By Max D. Bolar

CONSERVATION on his woodland is one of the important money-making soil and water saving measures Chairman N. K. Calloway of Arkansas Union County Soil and Water Conservation District uses on his farm at El Dorado.

Calloway's interest in conservation on woodlands started after World War II, when cotton farming on the hills was on its way out.

"We hill farmers knew we had to change with the times," he recalls. "It was either change or lose what we had. Livestock was coming in about that time, and there were the big wood-using industries trying to get us interested in tree planting. I got interested."

He not only planted trees on his own farm but he contract-planted for other farmers and landowners. In fact, he designed and manufactured a tree-planting machine which sold in several States. In one of the busiest planting seasons, he contract-planted more than a million trees.

Here's how he has made conservation on his woodland return max-

imum profits:

"Bless my soul! I wouldn't think of letting anyone cut my woods for me—that's where more than half of the money is made," he says, after more than 15 years' experience in marking, cutting, hauling, and marketing his own woods products. "Do it yourself."

"You wouldn't have someone raise and harvest your other farm crops if you can do it yourself. Why should your woodland crops be any different from other crops? The tractor-drawn farm trailer and chain saw have taken the place of the slow team, axe, and crosscut saw. These modern tools have made it easier for farm folks to do their own woods work."

"Moneywise I'll prove my point," Calloway explains. "Which would you rather have—\$5 a cord for pulpwood, or \$13? That's the difference in selling stumpage and in marketing your own. With sawlogs, there is \$15 to \$25 a thousand board feet difference."

"There are other advantages. Selling on the stump you are at the buyer's mercy. Cut your own and deliver it to the mill, and you get good log scale. Also, if you know your log grade you can get an even better price. Don't forget, either, that when you cut you're going to do less damage to your woods than when the other fellow cuts."

But Calloway's activities are not limited to woodland conservation. Through the soil conservation district with Soil Conservation Service technical help he has helped to

pioneer other conservation fields. For example, his planting of Pensacola bahiagrass was one of the first in south Arkansas. And he was one of the first to sod his pastures with bermudagrass.

He also built two ponds to meet the needs of his growing and likewise money-making beef and hog herds. His ponds bring him additional profitable benefits. They not only provide for the Calloway's own sport and table, but he also collects a reasonable fishing fee from a constant stream of recreation-bent city folks from nearby El Dorado.

Meantime, back at the woods, Calloway always finds time for improvement. He has completed his timber stand improvement to make room for fast growing pine and high quality hardwoods, and also learned from foresters how to mark and cut his own woods selectively. For his woodland conservation work, Calloway is recognized by the major wood-using industries as a Certified Tree Farmer.



Calloway demonstrates chain saw at one of frequent demonstrations in his woodland.



He is proud of his certified "Tree Farm" sign Forester John Collins of International Paper Co. helps him hold.

Note.—The author is woodland conservationist, Soil Conservation Service, Little Rock, Ark.

Economic Factors Essential in

By Dona

THE financial gain that results from successfully completed conservation programs is a principal benefit to the individuals or community involved. Conservation financing through credit or cost-sharing accordingly very often can mean the difference between getting a farm or watershed conservation program started or having no program at all.

Behind every adequate conservation job on the land there is a basic conservation farm plan, based on a detailed soil survey. This plan includes the safe uses and treatment for the land and the measures that will protect and improve the land and farm water resources, contribute most to a sound management program for the farm, and aid in the solution of watershed and other resource problems of the community.

It is essential that these physical adjustments fit into a system in which cropping and livestock operations make use of the land, labor, buildings, and equipment, and the financial resources of the farmer in such a manner that his farm is maintained as an income producer. In short, the farm conservation plan simply ties together the physical changes in land use through conservation practices with sound farm business.

A well-planned conservation program usually calls for some financial outlay, and often for temporary economic sacrifices while the new system gets into effective operation. Farmers naturally are more interested in using the soil and water conservation measures that can be shown to be profitable. We accordingly find it essential to

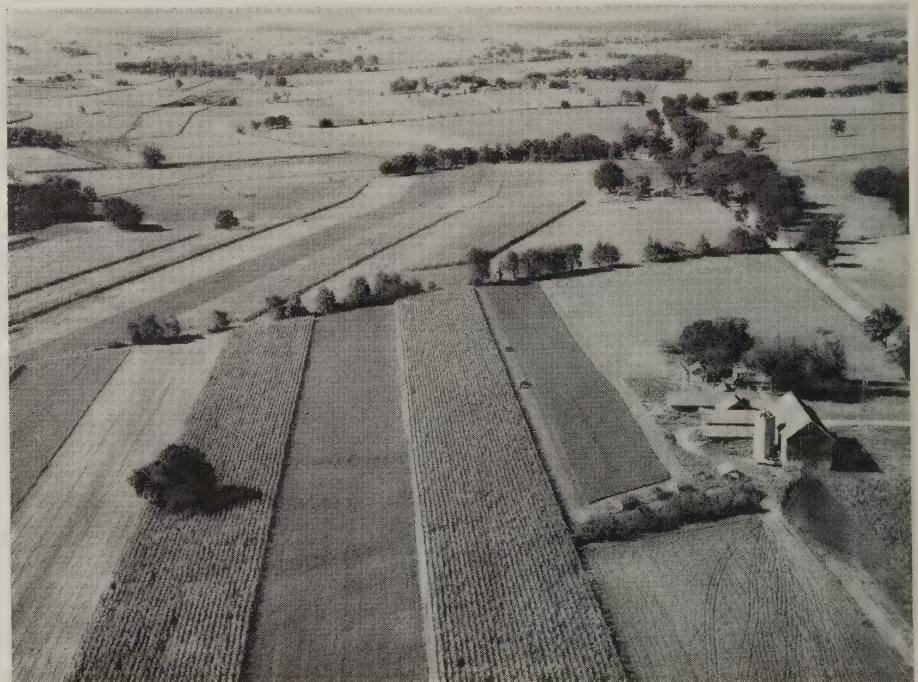
be able to give the farmer estimates of the expected costs and returns involved in adopting a conservation program.

The Soil Conservation Service works in cooperation with Federal and State research and extension economists and soil conservation district governing bodies in evaluating economic problems that arise. They come up in connection with planning and technical assistance to the districts, in watershed projects, and in the Great Plains and other conservation programs in which the Service shares responsibilities.

To this end, we have several conservation specialists with economic training and experience in our farm and ranch planning division, in our engineering and watershed planning units, and elsewhere as

needed. We also seek to have all of our planning and other people giving technical assistance aware of and informed as to the probable economic effects that the installation of conservation measures, like other capital improvements, will have on farm operations.

Over the country, a considerable amount of information has been obtained on cost and returns of conservation practices. We hope to have more of this information, to supplement consistent observation and experience over the years that such practices help the farmer operate more efficiently and profitably. When bankers, for example, are called upon to lend money for installing farm or watershed conservation measures, they naturally welcome all the information they can get as to how those measures



Arnold Theede's farm in Dodge County SCD near Danville, Wis., shows conservation farming pays, as does the Lawrence Ehrke place beyond.

Note.—The author is administrator, Soil Conservation Service, Washington, D. C.

Sound Conservation Program

Williams

may be expected to pay out.

The Soil Conservation Service is the agency responsible for technical leadership in the Department of Agriculture's soil and water conservation and watershed activities. As such, it encourages farmers, watershed organizations and others with whom we work, at their request, to take advantage of all available facilitating services, governmental or private. There seems to be general agreement in such responsible quarters, for example, as the Department's Soil and Water Conservation Advisory Committee for continued encouragement of State, local, and private financial support for soil conservation districts and the soil survey.

It is Department of Agriculture policy to encourage private lending agencies to make needed loans

for soil and water conservation to the extent possible, with Department authorities for such loans used only when private credit is not available. These authorizations include both direct and insured loans through the Farmers Home Administration for applying conservation practices. The 1954 Watershed Protection and Flood Prevention Act provides for Federal loans for watershed activities. In addition, of course, there are the cost-sharing provisions of the Agricultural Conservation and Great Plains Conservation programs, with emphasis upon permanent-type conservation practices.

We have come a long way in State, local, and private financing of our conservation undertakings. Twenty years ago, for example, financial support to the soil con-

servation district movement was almost entirely from the Federal Government, as it had been for the earlier erosion control project and Civilian Conservation Corps work. Today, people are combining local, State, and Federal effort to accomplish their conservation objectives.

This healthful trend was confirmed in a study the Soil Conservation Service made to find out how much local, county, and State money or its equivalent was being used for the soil conservation districts program, aside from bank or other credit. We learned that non-Federal participation valued at \$1 was being made to the districts' program for operating costs for every \$3 made available from the Federal Government. An earlier study showed that the farmers' outlay for materials, labor, and machinery operation, and other costs was about five times as much, on the average, as the Federal Government's contribution in technical or other assistance.

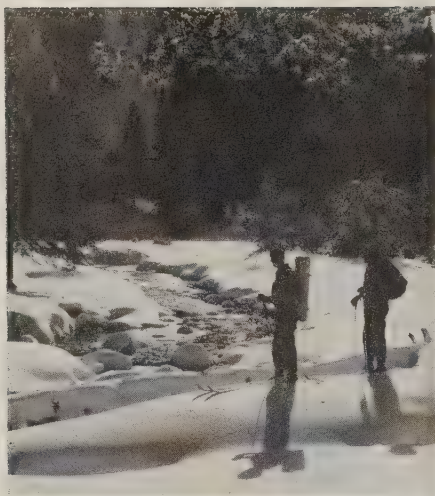
The non-Federal contributions included State and county appropriations, facilities, or services. They also included local contributions by private individuals, civic and municipal groups, business firms, associations, and clubs.

Another important form of local help to districts, on which it would be difficult to place an exact dollar value, is the time and services given by public-minded individuals and others who believe in conservation and support it.

These developments only confirm that we most certainly would not be experiencing today's continuing farm and watershed conservation expansion if it did not pay its way—and more!



Money-making purebred Angus cattle knee-deep in tall fescue and Manganese bur clover on Fred B. Wilson farm near Duluth, Ga.



Snow survey team climbs mountain watershed.

FROM Winnemucca to Wenatchee and from the Rogue River to the Rio Grande Soil Conservation Service and cooperating snow survey men are eyeing the approaching winter as they inspect their skis and snowshoes and tinker with their tractor-type machines designed to "go in the snow."

By January, members of this far-flung, mostly part-time, crew of about 1,100 will be making their monthly forays into key mountain snowsheds. From this effort, involving 1,400 snow survey courses, come monthly outlook reports that have become "bestsellers" among agricultural, business and industrial, and other water users of the West. These reports indicate how much water should be available during the coming growing season, and how much for carryover to the following year. Federal, State, and local agencies and private interests cooperate in this economically significant venture.

The Soil Conservation Service coordinates snow survey and water-forecasting activity in 11 Western States. The California and British Columbia Departments of Water Resources carry out their own surveys, the data from which are carried in the overall reports, including the key April Westwide

SNOW SURVEYS MEAN DOLLARS For Agriculture and Industry

By Robert F. Tegner

water forecast.

The economic benefits accruing from this activity are more than considerable: Water supply is important to everyone—business, agriculture, soil, water, forest, and other conservation interests, and to the man on the street. For that reason, data from the snow surveys are made available not only to farmers and ranchers, but to flood-control agencies, municipalities, power companies, and many others.

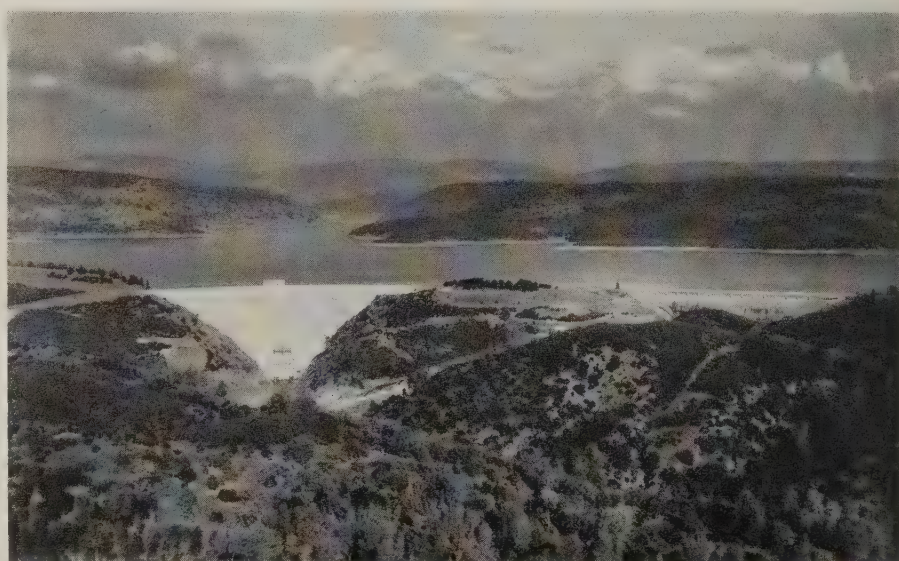
In the West, most of the water supply falls on the mountains in winter as snow, then melts and runs off to irrigate farmland, turn power generators, and supply other water needs of millions of people. The West wants—must have—information on how much of this "gold" it can spend each summer, how much it can save for the future. To find out, the snow surveyors go where the water is stored—to the mountain snowfields. In addition to the overland snow

surveys, other surveys are made by means of aerial photos of snow markers set up in remote areas.

Knowing with reasonable accuracy in advance how much water may be expected and how much has to be managed in private and Government reservoirs well may spell the difference between success and disaster for the water users, in addition to contributing to another economically important factor of benefit to all—flood control.

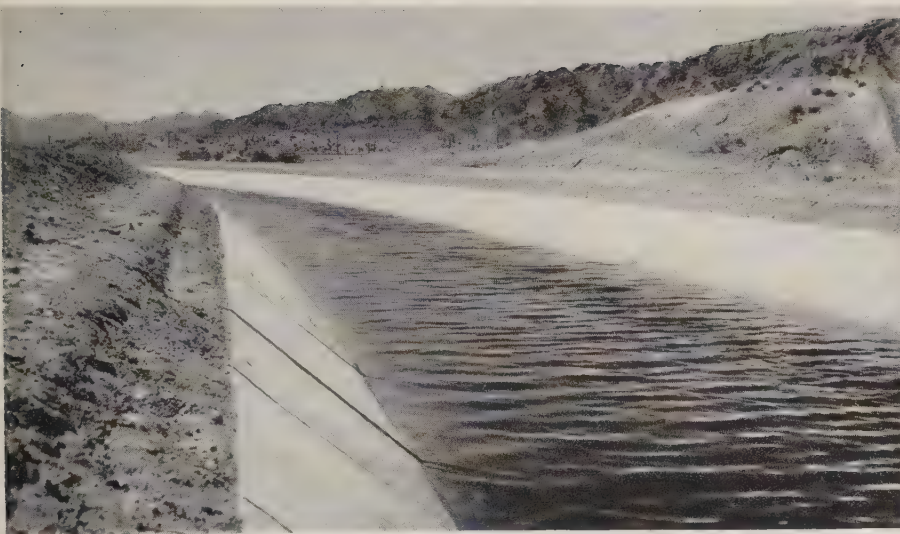
Reports of the Columbia Basin Inter-Agency Committee show, for example, that from 1951 to 1961, potential flood damage of about \$60 million was averted through control operations on the network of multipurpose dams in the Columbia River system. A substantial part of the data for planning control operations came from the snow surveys.

In Oakland, Calif., Manager F. B. Blanchard of the East Bay



East Bay Municipal Utility District's Pardee Reservoir on Mokelumne River supplies water to a million people in east San Francisco Bay area. Snow surveys and precipitation data help in managing water.

Note:—The author is field information specialist, Soil Conservation Service, Berkeley, Calif.



A typical irrigation canal in the West.

Municipal Utility District's water resources and planning division cited last spring's operation as an example of how water-supply forecasting means extra dollars in the utility treasury. Relying on forecasts of the California Department of Water Resources, EBMUD managed release of 160,000 acre-feet of water to keep its relatively small generator going through the spring. Power is a byproduct which EBMUD sells to Pacific Gas and Electric Company. Return to the utility is about \$1 from each acre-foot of water, Blanchard said.

Because the principal business of the utility is to supply water for 1 million people in Alameda and Contra Costa counties east of San Francisco Bay, the reservoir behind Pardee Dam on the Mokelumne River must be controlled to keep water going in the river to downstream users with vested rights, and yet store water for controlled release to the 90-mile water-supply canal. Only fairly accurate estimates of supply and runoff could enable the utility to do this, Blanchard said.

Knowledge that plenty of water would be available this year enabled A. S. Murphy, San Francisco lumberman and owner of the Flying M ranch in northeastern California, to put in additional pasture and hay land for his 2,000

head of beef cattle.

In Ogden, Utah, Keith Orme, secretary-treasurer of Amalgamated Sugar Company, pointed out that the forecasts influence overall management policy, plus decisions in each operational season on contracts for more than 100,000 acres of sugar beets in Utah, Idaho, and Oregon.

In Oregon, Paul House, manager of the Owyhee Project North Board of Control, said early spring water-supply forecasts make it possible for water users to plan far enough in advance of planting time to take advantage of a surplus of water or be ready for a short supply.

Warren G. Goines, senior engineer for Bechtel Corporation, said the water-supply forecasts play an important part in designing and supervising construction of dams, like a proposed dam in Buffalo Rapids on the Flathead River for the Montana Power Company, and Round Butte Dam on the Deschutes River in Oregon for the Portland General Electric Company.

The Santa Fe Railway Company indicated its interest and dependence on the snow survey water-supply forecasts in a crop report late last summer, in which it noted that "water supplies for the current irrigation season are fulfilling

earlier predictions that 1962 would be a good water year."

The benefits of snow survey-based water forecasts also are fresh in the minds of Spreckels Sugar Company of San Francisco and sugar beet growers in Fallon Irrigation District of Nevada. Early forecasts indicated a particularly tight water situation for 1961, Agricultural Manager Hugh F. Melvin said. Consequently, no beet acreage was contracted in the area—saving growers the cost of planting a crop that might have failed. The company was able to make other plans to avoid loss in production. This year, water was apparently going to be plentiful, and contracts were again signed between Fallon growers and Spreckels.

Other snow survey cooperators in western industry include the Idaho Power Company, the Public Service Company of Colorado and New Mexico, Utah Power and Light, Washington Water Power Company, and Puget Sound Power and Light Company. Southern California Edison, Pacific Gas and Electric, and Pacific Power and Light are among firms which have established and measure snow courses and contribute this information for the cooperative snow survey.

Banks and other credit agencies also are among the various business and commercial interests that rely upon water-supply outlook information to assure themselves that agricultural and industrial users have an adequate water supply when they submit a plan of operations for support or request for credit.



Three stock ponds he built through the West LaMoure County Soil Conservation District program have enabled Francis Podenski of North Dakota to save 2 hours of labor a day he previously spent hauling water from town.

Campsite Outpays Cattle

For Part-time Farmer

By Robert E. Myers

AN odd circumstance put the James Gordon family of Newfield, N. Y., out of a thriving part-time cattle business and into an even more profitable recreational venture.

When Gordon's rapidly developing herd required better watering facilities, he built a half-acre livestock watering pond with help of the Soil Conservation Service. It is one of the measures developed in his conservation farm plan through the Tompkins County Soil Conservation District with which he has been a cooperator since 1952. Others include contour stripcropping, pasture improvement, and woodland fencing.

But as his herd expanded, Mrs. Gordon's health grew steadily worse. An examination by a specialist revealed she was allergic to cattle!

Without hesitation, Gordon, who is employed full-time in town, sold his herd and put his farm into the "Soil Bank." The new pond stood unused. Two circumstances in particular prompted him to convert their idle farm into a public campsite—Willowood—after it was out of the Soil Bank:

His Boy Scout troop had had many enjoyable times camping by the pond. Also, just half a mile from the Gordon farm is Robert H. Treman State Park, from which several of the many campers turned away because of crowded conditions had asked the Gordons' permission to camp in their vacant meadow overnight. The farm also is within short traveling distance of two other State parks, Cornell University, the New York State wine

cellars, and Cayuga Lake, so that their proposed camp could serve touring campers taking short side trips.

With encouragement from the Finger Lakes Association, the Gordon family began work on their camp. The first year, 1960, they were able to prepare 10 campsites of 1,000 square feet each, located among the trees to give the campers privacy. The next year they developed a group of camping sites in an open area, for campers who enjoy being together.

Today there are 30 campsites, each with a fireplace, tent platform, picnic table, and garbage cans. There is a centrally located well, and sanitary facilities for each 15 families.

The farm pond, with two docks and up-to-date safety equipment and rules for its use, is next to a likewise well-equipped athletic field and is the center of activity. Each

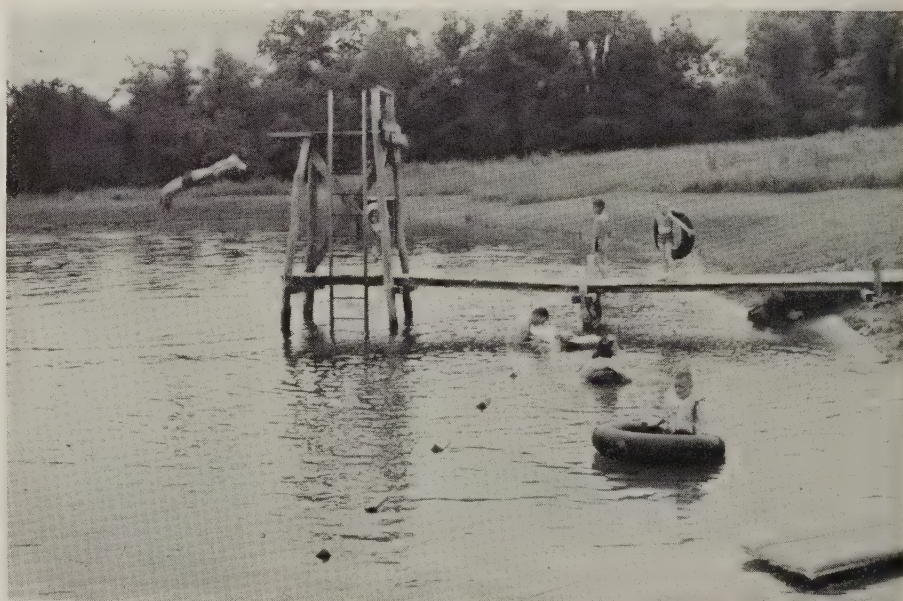
Saturday and some Wednesday evenings, the Gordons organize a big campfire program. The County Board of Health determined the standards for health and pond safety.

Willowood has had campers from England, Canada, and many States.

The small barn was converted into an office and store, of which 14-year-old Linda is manager. Son Jim, 17, is the general camp manager, and Scottie, 7, is "good-will ambassador."

"Many people think that once you have built a few campsites you can sit back and rake in the money, but this isn't true," Mrs. Gordon said. "A good campsite requires a lot of time and hard work, as we have learned from experience. Without our three children, we couldn't have developed Willowood. We couldn't have possibly hired someone to do all the work. This family venture has been a good education for our children. It gives them responsibility. We all enjoy making Willowood a pleasant place to camp, and it pays well, too."

Gordon gave a hint of how well: "We are realizing more from our Willowood campsite than we did from our part-time farming operation."



The former livestock water pond being enjoyed by Willowood campers.

Note.—The author is biologist, Soil Conservation Service, Batavia, N. Y.

Swapping Cropland For Grass

"Good Business" In Great Plains

By H. A. Wiltzen

LOUIS B. Salsbery of White-water is one of many Montana farmers who is swapping cropland for grass and betting he'll come out well ahead. In fact, he is sure he already has.

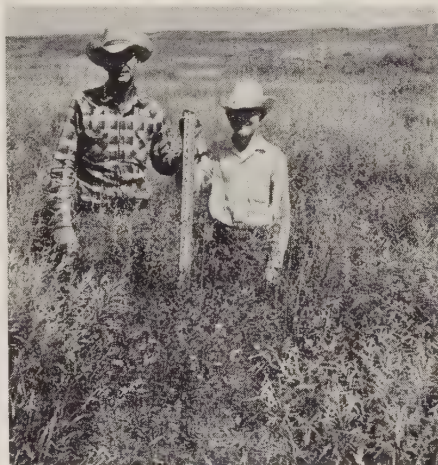
Three years ago, he had more problems than he figured a man had a right to. He sorely needed more tame pasture. Then, raising annual hay crops by late-seeding of spring flood areas wasn't working out. Often he lost the crops and had to buy hay at a high price. Salsbery had gully trouble, too, where occasional heavy runoff coursed across the tilled fields.

Grass had been Salsbery's main crop. He knew its value in the control of erosion, and suspected that, weighing income against cost, grass might do better than grain. Salsbery has been careful for many years to practice conservation use of his grass. He sees to it, for example, that the cattle do not take more than half the forage produced each season on his native range.

The new Great Plains Conservation Program made it possible for him to make the change faster than he otherwise might have done. With the help of the Soil Conservation Service working with the Phillips Soil Conservation District, Salsbery worked out a complete soil and water conservation plan. That was in 1959, soon after Phillips County was designated in the program.

His plan called for seeding of 78 acres of cropland to permanent hay and pasture. He says that not only will take care of future erosion, but will mean grass from now on when his cattle need it most. Other money-saving benefits in-

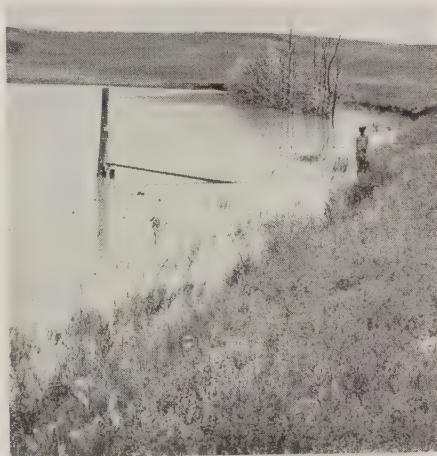
clude being able to trim hay costs to a realistic minimum and dis-



Louis and Wayne Salsbery measure irrigated smooth bromegrass-alfalfa hay stand.

persing with some of his more expensive machinery.

The plan also includes water developments to permit uniform use of all his grazing lands. By the time Salsbery finishes work on his



Their irrigation-stockwater dam.

plan next year, he also will have cross-fencing for better management of his grass. He is certain his ranching operation will have

been strengthened.

"We are supposed to get 12 inches of rainfall a year here, but none of us can remember when we got that much," Salsbery said. "This is grass country; history has proved it. We are better off with grass and hayland in a livestock operation. This plan, when I'm through getting it on my ranch, will give me the best use of moisture I can get. I'm increasing output, cutting costs, and taking out some of the risk. That's just good business, any way you look at it."

Have You Seen?....

• "Land and Water Resources—A Policy Guide," published by USDA. This 73-page report by the Department's Land and Water Policy Committee makes recommendations for achieving a balanced program of land and water resource development, improvement, and adjustment. It grew out of three questions posed at the January 1962 National Conference on Land and People: How can better use be made of the land currently in farms which in the foreseeable future will not be needed for crop production? How can the rapidly growing demand for land for recreational, urban, and other uses be satisfied? How can resources be used to generate new economic opportunities for 1¼ million underemployed persons in rural areas?

• "Basic Statistics of the National Inventory of Soil and Water Conservation Needs," USDA Statistical Bulletin 317. In addition to the statistics, there is a brief discussion of the findings, land capability and land use, conservation needs on the inventory acreage, and watershed project needs.

Note.—The author is work unit conservationist, Soil Conservation Service, Malta, Mont.

Planning for Conservation

By Billy S. Peavy

Pays, too!

IT took California farmers Tony LaSalvia and David DeGregori just a year to develop a conservation plan that has changed their rundown alkali-ridden farm near Los Banos into an efficient and profitable livestock-orchard unit. Ordinarily, a plan for overhauling 250 irrigated acres would take years, but they wanted quick action and got it.

As the old Brand farm was when they took it over, it simply couldn't be managed efficiently—too many fields, odd-shaped fields, irrigation

ditches hard to maintain, and individual field acreages and soil conditions unknown. After the "face lifting," these problems vanished. Now there are only 9 fields instead of 15. They are largely squared off for more efficient irrigation and cultivation, measured and numbered; and a soils map shows the kind of soil in each field. Another map of the farm, made to scale on an aerial photograph, shows where everything is.

After soil and engineering surveys were made by the Soil Con-

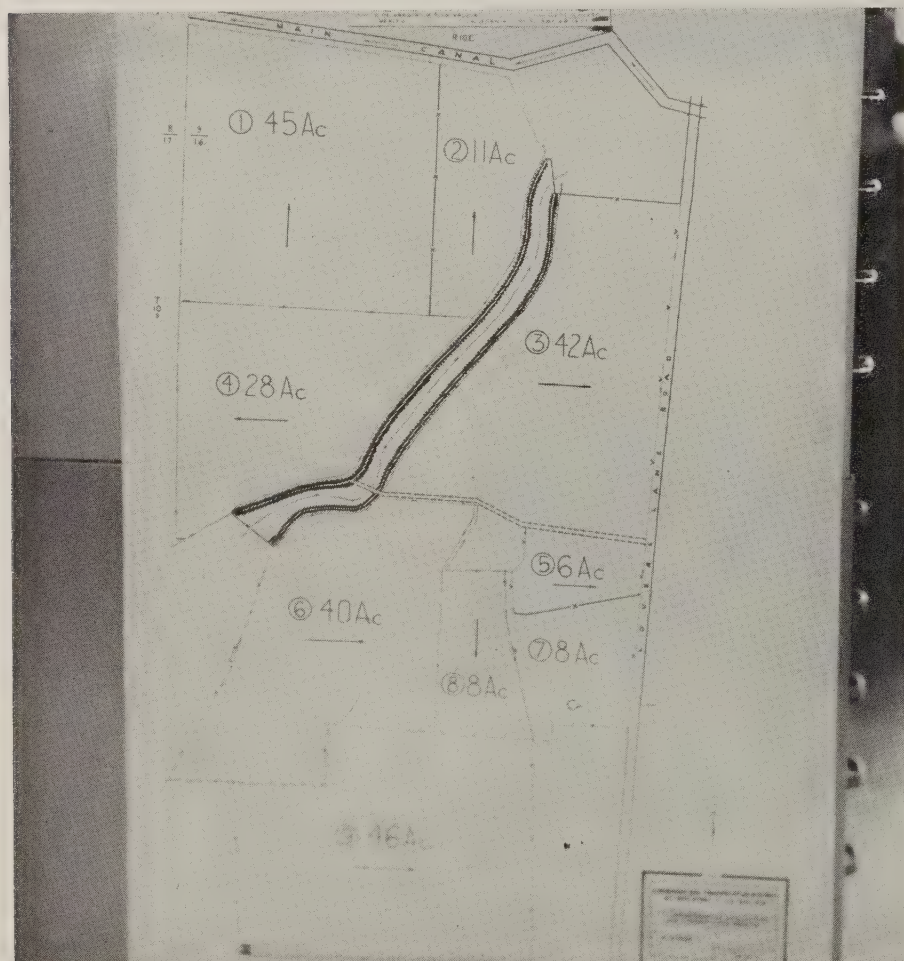
servation Service at the request of the Los Banos Soil Conservation District to which they had applied for help, the new owners worked out their overall plan and immediately began to carry it out. They brought in heavy earthmoving equipment, ripped out the old, meandering fences, and dozed in the crooked, poorly built irrigation ditches.

Four of the original fields included 96 acres of potentially good irrigated pastureland but had no water rights. The land was dotted with bare alkali spots and salt-grass. Dry sloughs cut through the fields. Even if irrigation water had been available, the land was much too rough to get uniform irrigation, and there were no drains to carry off excess water necessary for leaching out the salts.

LaSalvia and DeGregori decided to drill a well to irrigate these dry pastures, now divided into only two fields, with the fences rebuilt along soils lines where practicable. Having soils of the same texture and depth in the same field, made it easier to irrigate all parts of the field to uniform depth.

Next, to get rid of the alkali, 7,500 feet of new, deep drain ditches were built. A fescue-trefoil demonstration plot, sponsored by the Los Banos district on the same kind of alkali land a few miles away, had settled any doubt they could convert this alkali land to good irrigated pasture.

Another big problem was taming Los Banos Creek, which cuts through the middle of the farm and had flooded and ruined crops every few years. Its channel was



Land-use map of the farm layout after planning. Fields 2 to 8 irrigated cropland; fields 1 and 9 irrigated pasture.

Note.—The author is soil conservationist, Soil Conservation Service, Merced, Calif.



Los Banos Creek looked like this before channel was improved.

straightened and cleaned, and more than a mile of dike was built on either side to keep the floodwaters within banks.

An irrigation ditch also was needed on each side; but the soil was deep and sandy and would drink up water like a sponge. A mile of concrete-lined ditches were

built to overcome that problem.

All the land except the creek bed, or 236 acres, was leveled to make proper irrigation and drainage possible. One field of alkali land was greatly improved by having a thick layer of good loam fill spread over it, making possible easy germination of grass seeds.

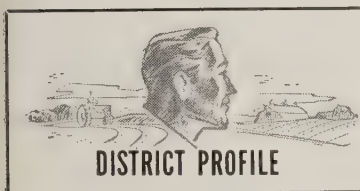
By 1962, only 3 years after the program was begun, results already were striking. Clear, fresh irrigation water runs in weed-free concrete ditches. Good irrigated pasture grasses now cover the old, alkali spots. A vigorous young orchard covers a part of the land to help diversify the program.

LaSalvia and DeGregori report that many hours have been saved by the new arrangement of fields and irrigation system layout, and that thousands of gallons of water have been saved by the concrete ditch lining. Will this program also pay off in dollars?



This is how it looked after it was straightened and diked.

"It has already begun to pay off," DeGregori said. "Our almond orchard begins bearing this year. Our net income is increasing every year. It would have been impossible to make any money on this farm the way it was. We're not worried about getting our investment back."



"Mr. Will" —

Dedicated Conservation Banker

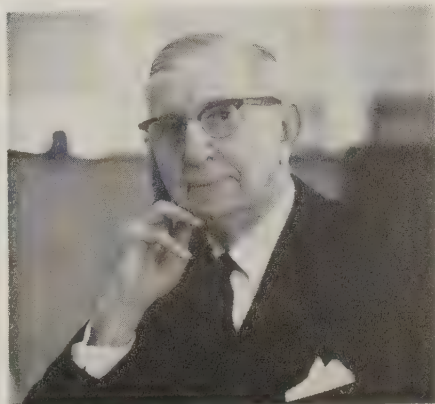
FOR more than a half century the name William Wilson Campbell of Forrest City has been synonymous with sound banking and soil conservation in Arkansas.

Farmers know "Mr. Will," as he is affectionately called, as the banker to turn to when they need a crop loan, or money to buy a new piece of farm equipment or finance a soil conservation plan.

Conservationists know him as a dedicated disciple of good land use and one who has played a prominent role in the organization and operation of the St. Francis County Soil Conservation District. All of his farmer customers are district cooperators; and the bank's policy has been to make loans for soil and water conservation improvements.

Mr. Will is chairman of the

Board of the National Bank of Eastern Arkansas, where he started in 1909 as a bookkeeper and became president in 1923. Under his guidance, its resources have grown from \$72,000 to more than



"Mr. Will" William Wilson Campbell.

\$12 million, with capital assets of more than \$1,400,000. The bank has never passed a dividend, suspended payment on deposits, or foreclosed on a farm, even though it presently has more than \$6 million in outstanding loans—a lot of them farm loans.

Besides being one of the most successful country bankers in America, Mr. Will is nationally known as a farm expert with broad knowledge and experience in soil conservation. He got interested in soil conservation back in 1935, when a demonstration project and a CCC camp were established in St. Francis County. Some of the land in the county had been in cultivation for 100 or more years and was so infertile that many farmers believed it was completely worn



His bank.

out. But those "wornout" farms soon were being transformed into highly productive units.

When the first State soil conservation district enabling act in the Nation was passed in Arkansas in 1937, Mr. Will became a prime force in organizing the St. Francis County district. He was elected a supervisor on the original board, and has served in that capacity continuously since.

During the last quarter-century, Mr. Will has preached soil conservation with a fervor almost equal to that of his old friend, the late Hugh H. Bennett. "Fertile soil is the first necessity for profitable farming" has been his text.

Talk to Mr. Will, and he will tell you about farmer after farmer whose crop yields have doubled and tripled after a few years of soil conservation farming. One, whom he identified only as "Farmer A," was operating a farm 25 years ago that was so eroded and depleted of fertility it took 700 acres of cotton to produce only 198 bales; and corn wouldn't yield enough to justify its cultivation. Today, this same farm is one of the finest in the district. It is easily worth \$400 an acre, and yields 1 to 1½ bales of cotton and 60 to 70 bushels of corn an acre. The owner has built a \$35,000 home, and his farm has modern, labor-saving equipment.

Mr. Will likes to point out that "Farmer A" has money, security, good land, and doesn't owe any-

thing—and that it all came from the soil. And, he adds, there are hundreds of farmers in the district who are demonstrating the soundness of conservation to a degree that cannot be disputed.

While soil conservation has contributed greatly to the overall welfare of farmers, the community, and the town, Mr. Will says there still is a potential benefit, as yet unrealized, which sometime may prove a boon equally as great as that of increased income and more efficient farming. It is his belief that, as each new farmer joins the soil conservation district program, the farm problem will be "reduced by one," if there should be a downward adjustment of farm prices. He explains it this way:

Soil conservation farming permits more efficient production at lower cost. It enables farmers to diversify and add profitable new enterprises, and not be financially dependent on a single crop. For example, 25 years ago farmers in St. Francis County depended almost entirely on cotton. Through their soil conservation district program, they've added soybeans, rice, fruit, and vegetables; as well as corn, oats, hay, and pasture that have made an expansion of livestock production possible.

St. Francis is an agricultural county, and farming is the backbone of the economy of both the county and of Forrest City, the county seat. According to Mr. Will, soil conservation definitely

has increased net income of both farm and town businesses, and and this has had a corresponding effect on bank deposits in Forrest City. Supporting him are figures showing that during a period when bank deposits in the United States increased by 160 percent, and in Arkansas by 371 percent, deposits increased in Forrest City banks by 416 percent!

An improved economy had something to do with this, of course; but Mr. Will is convinced that soil conservation was responsible to a large extent for the big spread between the increase in deposits nationally and locally.

Another angle which Mr. Will believes should appeal to country bankers is that sound loan opportunities are opened when farmers become soil conservation-minded. While conservation farming enables farmers to make phenomenal financial progress, the adjustment to a complete conservation plan of operation frequently requires the use of borrowed capital. Because of this fact, he maintains that every country banker should assume a key position in developing a sound program of soil and water conservation.

Mr. Will's work in soil conservation has been the subject of articles in banking and national popular magazines and newspapers. He recently was named to the Salk Fund Council. Other recognition has included his selection as *Progressive Farmer* "Man of the Year," Arkansas chairman of the U.S. Savings Bond Program since the first bonds were offered in 1941, membership on the Hoover Commission to study Government lending, life membership in the 4-H Clubs, and chairman of the American Bankers Association's Agricultural Council.

In 1949, he was awarded the degree of Doctor of Laws by the University of Arkansas, partly because of his leadership in the conservation of natural resources.

—HOWARD T. BARNETT

\$170,000 SAVING SEEN

In Irrigation Canal Lining

By Ray H. Kerr

TWELVE years ago the Wilson Irrigation Company of Weber County in Utah lined the first section of its main canal with concrete. This year saw the completion of 45,000 linear feet of lining since then, with resultant major savings in water and other costs.

The company diverts approximately 40 second feet of water from the Weber River into about 10 miles of main canal serving close to 4,000 acres of cropland. The soil through which the canal flows is very light textured, and seepage losses were high from the originally earth-lined canal, the banks of which were weak in places. Early each year, the canal's wetted surface would decrease losses, but later in the season weed growth backed up the water and losses became excessive—estimated to be 30 to 40 percent.

Note.—The author is work unit conservationist, Soil Conservation Service, Ogden, Utah.

In 1950 the company entered into a cooperative agreement with the Weber Soil Conservation District, the Utah State Agricultural Experiment Station, and the Soil Conservation Service to field test certain types of lining. The test lining resulted in a complete plan to line the system during the next 14 years. About 1,200 feet at the head of the canal, with a typical soil condition, was the first lined; and it proved the value of lining in savings in operation, maintenance, and water.

By the end of 1962, nearly 5,600 cubic yards of concrete had been poured, at an average cost of \$4 a linear foot, not including the cost of measuring devices and turn-outs. About 15,000 linear feet of canal remained to be lined after 1962. The canal ranges from 2 to 4 feet wide at the bottom, with corresponding depths. Concrete was placed by hand, using 10-foot templates, and by a power-operated

slip-form machine.

Company Secretary-Treasurer J. J. Gibson said the records show that investment in the lining, since that early beginning, will ultimately reach about \$170,000. Agricultural Conservation Program funds have cost-shared about \$85,000 of this amount, and the Soil Conservation Service, through the district, has furnished surveys, plans, and specifications.

Company officials believe that savings in water, maintenance, and operation will rapidly repay the cash and labor outlay. Assuming an average streamflow of 40 cubic feet per second and a 30 percent loss, in a 5-month irrigation season, the loss would amount to 2,500 acre-feet, Gibson said. Current contract price for water delivered to the company is \$2 an acre-foot. Thus the lining theoretically could save \$5,000 a year in water alone.

Alvin Anderson, company president, said moreover that the lining in the upper portion of the canal meant the difference between a crop and no crop during the 1961 critical water shortage.

◆
Almost \$100 billion—nearly one-third of the U. S. consumers' annual expenditure—goes for food and clothing produced by or made from the products of agriculture.

◆
Investment in agriculture represents \$21,300 for each farm employee, compared with 15,900 for each worker in the manufacturing industry. Ohio farm economist predict future capital investments of more than a quarter of a million dollars for some farms.



This Wilson Irrigation Co. concrete-lined canal near Taylor, Utah, was a hand screed job and cost \$5 a foot.

Economical Erosion Control Structures

Replace Expensive County Bridges

By Eugene E. Solomon

ENTHUSIASTIC cooperation between all interested parties has resulted in an outstanding and money-saving road program in Nebraska's Washington County. The cooperators include farmers, county road officials, the Papio Soil and Water Conservation District supervisors, local Soil Conservation Service technicians, and a local construction contractor.

It was back in 1935 that the county began to replace bridges with erosion-control structures. Since then, nearly 200 of these structures have replaced expensive bridges. A local contractor who installed nearly all of the county's drop-inlets reports that 100-foot span bridges have been replaced by drop-inlets with a 4- by 4-foot barrel. These were built at a fraction of the cost of the bridge. Clarence Kuhr, county road superintendent, says: "Once the drop-inlets have been installed, our

troubles with that piece of road are over."

Road officials estimate that drop-inlets have saved the county nearly \$1 million during the past 27 years. This included a \$10,000 a year saving in maintenance cost as well as the original cost of the bridges. The most expensive road structure yet built was installed in 1961 at a cost of \$19,000. This structure replaced a bridge 120 feet long that had fallen into the creek below. It was estimated it would have cost \$40,000—or more than twice as much—to replace the deck of the bridge, not counting the cost of maintenance, and perhaps even replacement in a few years.

Even though the construction of drop-inlets has meant great savings to the county over the past 27 years, there is still a greater benefit. It has demonstrated to farmers the benefits of applying erosion-control measures of this kind. Every time



Structure with water behind it and no maintenance needed after nearly 10 years. Road was graveled and road-sides grassed.

a farmer drives to town, chances are he crosses one of these bridges. He observes how a gully has been healed after a road structure was put in. This observation often inspires him to develop gully-control structures on his own farm.

Because the drop-inlets stabilize grade in drainageways, smaller erosion-control structures can be built on the farms above the road structures. With stable outlets installed, farmers can develop grassed waterways, terraces, and contour farming above the structures. In other words, road structures often are the key to applying complete conservation on adjoining farms.

Hjalmer Quist, chairman of the Papio district says: "When all of the local agencies, as well as farmers, work together, it is bound to result in more and better conservation on the land. Everyone benefits, both town and country people."



Old, unsafe bridge—third built across gully west of Herman, Nebr.—being replaced in 1953 by drop-inlet.

Note:—The author is work unit conservationist, Soil Conservation Service, Blair, Nebr.

Primrose Path for Florida Beef Cattle

By Thomas N. Shiflet

CATTLE "walkways" are an important part of a complete soil and water conservation and livestock plan that has enabled Mark Richard to double his beef production on three salt marsh range units in Cameron Parish in Louisiana. The cattle walkways, proper use of range and pasture forage, deferred grazing, brush control, and pasture improvement are the major features of his plan developed through the Soil Conservation Service in cooperation with the Gulf Coast Soil Conservation District.

One place formerly could not be grazed at all until 2 miles of walkway was built. Beef production on the other two has increased from an average of 24,000 pounds a year to 43,000 pounds, because of a higher marketable calf crop



Cattle using a walkway on salt marsh rangeland more than $\frac{1}{2}$ mile from high land on Richard ranch. Richard says the walkways are the key to his ranching success. They enable the cattle to graze all the range evenly, and provide resting and feeding areas and relief from high water and mosquitoes. Formerly, they would graze only $\frac{1}{4}$ mile into the marsh.

Note.—The author is range conservationist, Soil Conservation Service, Lake Charles, La.

and heavier selling weights. Improved breeding, creep feeding of calves, supplemental feeding of

cows and bulls, and other livestock management practices have played an important role.



DESIGN OF REGIONAL ACCOUNTS. Prepared by the Committee on Regional Accounts. Edited by Werner Hochwald. 280 pp. 1961. Johns Hopkins Press, Baltimore, Md. \$6.00.

Here is a book that brings together some new concepts related to resource management and planning—a field which is the concern of our policy makers and administrators in the field of soil and water conservation. It points out the intricate relationships that exist among the different parts of the economy in an area or region.

The papers presented are the product of the first Conference of Regional Accounts in September 1960 at St. Louis, Mo. Dr. Harvey S. Perloff, director of regional studies for Resources for the Future, Inc., initiated the idea that regional accounts could become useful systems of information flow for public and private decision making.

The book deals with explorations by economists into ways in which a system of economic accounts can be useful and be established for regional analysis. Business accounts and national economic accounts have in common a framework to describe relations among the transactors of business and industry.

It points out that: "In the public sector state and local officials

make decisions about such things as public services, expenditures and taxes, transportation facilities, and the use of land and of other resources such as water, forests, and parks. In these efforts they can be materially aided by the engineer and physical planner on the one hand, and by the social scientist on the other. Thus, in order to decide on the desirability of specific objectives and a plan to implement them, benefit-cost analyses are needed."

These papers can be useful to the student or teacher of regional economics and development and to conservationists and others concerned with analysis of the national economy and public and private decision making.

—T. A. NEUBAUER

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LAND ECONOMICS RESEARCH.
Edited by Joseph Ackerman,
Marion Clawson, and Marshall
Harris. 270 pp. 1962. Re-
sources for the Future, Inc.
Johns Hopkins Press, Baltimore,
Md. \$4.00.

"Land Economics Research" is a scholarly presentation of particular interest to economists in universities and in Government. This book consists of papers presented at a symposium on land economics research jointly sponsored by the Farm Foundation and Resources for the Future, held at Lincoln, Nebr., in June 1961.

The subjects are grouped in four major headings: I Scope, Problems, and Objectives; II Theoretical Considerations; III Procedural Framework; and IV Program and Organizations.

Authors of the papers are Marion Clawson, N. M. Kelso, John F. Timmons, Coleman Woodbury, Roy E. Huffman, Ranier Schichele, Walter G. Miller, M. Mason Goffrey, Howard W. Ottoson, Glenn L. Johnson, Gene Wunderlich, W. L. Gibson, Jr., Marshall Harris, Harry A. Steele, and Joseph Ackerman. This distinguished group of economists, administrators, and professors has provided for posterity an intellectual exchange on land economics problems and research for those concerned with land use and land institutions.

These authors are impressed with

the interrelationships between man and his environment—what may inclusively be termed "Nature." They recognize that land problems are no longer as nearly agricultural as they once were. They make the point that the uses of land are often highly interrelated, sometimes actually on the same tract of land, or are potentially so, and that land uses often have physical, economic, and institutional interrelationships.

They recognize, too, that many problems affecting land require study from directions other than economics, including those of sociology, political science, law, and other disciplines.

Because of the authors' different interests, their essays approach land problems from varying theoretical backgrounds.

The prophecy is made that the requirements of a doubled or tripled population in the next 50 years can be met from our land and water resources by intensifying their use in similar proportions. The land and water problems of the future will arise from increasing competition and shifts between crops, grassland, forests, recreation, urban developments and other nonagricultural uses, and from expanding long-term requirements and similar demands. The problem of distribution of ownership and access to resources will continue to be an important phase of

land economics studies.

—NORMAN A. BERG

Have You Seen?....

● *Growth Through Agricultural Progress*, containing five lectures on the Centennial of the U. S. Department of Agriculture—"Profile of the USDA—The First Fifty Years"—"The Department as I Have Known It"—"The Land-Grant College: Past and Present"—"Contributions of Agriculture To Our Economy"—and "Agriculture, Today and Tomorrow."

● *Promise of the Life Sciences*, containing five lectures covering advances at the frontiers of biological research—"Biological Transformation of Energy"—"Genetics"—"Nutrition—the Chemistry of Life"—"Fine Structure and Pattern of Living Things"—and "The Organism and the Environment."

● *The International Age in Agriculture*, containing "Food for Peace"—"Technical Assistance in Agriculture"—"World Agriculture Market"—"Agricultural and Assistance Programs of Other Countries"—and "Helping Other Countries Improve Their Agriculture."

The above publications may be obtained from the The Graduate School of the U. S. Department of Agriculture, Washington 25, D. C.

JANUARY 1963

Soil Conservation





Soil Conservation 25 Years Ago

"It's Nature's way in Minnesota. It's bluegrass sod, and grassed waterways, and willow cuttings.

"It's legumes, and small grains—in strips.

"It's blotters instead of shingles . . .

"Spring Valley, Winona, Caledonia, Faribault. Four representative watersheds: Deer and Bear Creek's Gilmore Creek, Beaver Creek, Prairie Creek.

"Deep fall painting the Minnesota valleys in the hues favored by butternut, walnut, maple, sumac, ivy, and oak.

"Swift, cold streams where the sportive trout wait on a lightening of silt load.

"Lights blazing from the windows of rural homes where farmers again tally their books with black ink instead of red.

"Cows milked, horses bedded down, barns locked.

"Soils made secure, not only for tonight but for tomorrow."



COVER PICTURE—Women in conservation sometimes take to the fields, as witnessed by these two putting up hay on Wayne Luben's conservation-improved ranch in Rio Blanco County, Colo. (See SOIL CONSERVATION, October 1961.)

—Photo by B. C. McLean.

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Soil Conservation

ORVILLE L. FREEMAN
Secretary of Agriculture

DONALD A. WILLIAMS
Administrator, Soil Conservation Service

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget, June 26, 1958.

FRANK B. HARPER, Editor

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NACD Auxiliary Head Lauds Conservation Work of Women

By Mrs. Charles Gotthard

IN 1937 I came as a bride to Briar View Farms, our home in Wexford County, Mich. The love for the land which my husband and I shared created a desire within us to make the productivity of this land greater, yet improve its quality at the same time.

It is a great satisfaction to me to observe from where I now live nearby that our son, Stuart, and his wife, Betty, and their four children today are carrying on the conservation farming practices "Charles and Mary" used in bringing our farm to its present high level of productivity. I sold the farm to them last April, a year after my husband died.

Although we had no soil conservation district in those days, we did consult with the Extension Service people and asked many questions of resource people at Michigan State University as to the best methods of farming and the best types of grass and grains, fertilizers, and so on. We attended Extension meetings and adult farm classes at the local school, always with an eye and ear to better ways of treating our land.

In 1945, when a group of leading farmers of the county were called together to organize the Wexford Soil Conservation District my husband was elected a director, a post he held until his death.

We became district cooperators and followed our farm plan, developed with the help of the Soil Conservation Service, as nearly as possible. Because our land was level

and the soil of good quality sandy loam, people often asked why we needed a conservation plan. We were quick to point out the advantages of the half-mile long strips, rather than the crazy-quilt pattern we had used; our maximum tillage program which allowed the moisture to stay where it fell; our improved pastures.

We changed from general farming with our acreage in various grains, pasture, potatoes, and hay, to a program of grassland farming which included wheat, oats, and alfalfa. It was less work and more profitable. Our crops were utilized by our dairy herd, which provided our income. Windbreaks and multiflora rose aided in retaining the moisture on the land. The woodlot provided fuel and lumber.

Through the years, my husband's conservation work included his appointment to the State Soil Conservation Committee, his election to the presidency of the State Association of Soil Conservation Districts, and his appointment as a member of the National Association of Soil and Water Conservation Districts Council. In 1956, I was hired by the Wexford district as district aid, a job which I still have. In 1960, I was elected president of the Michigan Conservation Districts Auxiliary and served two terms. In 1961, I was elected president of the National Association Auxiliary, and am now serving my second term.

Charles and I farmed together, and we were fortunate indeed to have been in a position where we could assist, in some measure, in forwarding the work of soil and



Mrs. Charles Gotthard.

water conservation. It was our hope and prayer that across the width and breadth of this great country the land would one day be forever living and green. It was our hope, and is still my hope, that every man, woman, and child will come to know and understand conservation in its basic phases—soil, water, wildlife, and forests. Indeed, there is need to do more than know and understand it—there is a need to *live* it.

Far too often I have heard people ask: "What does conservation do?" Or they say: "I didn't know *women* were interested." It seems to me their question should be: "What can *we* do for conservation?" And I ask: "Why shouldn't women be interested? Doesn't soil and water conservation contribute greatly to their economic advantage? Doesn't it improve their environment? Doesn't it beau-

Note.—The author is president of the Ladies Auxiliary of the National Association of Soil and Water Conservation Districts, Traverse City, Mich.

tify their surroundings?" Of course women must be interested in conservation—not only interested, but actively so!

During the time I have served as national president, I have traveled America from north to south and east to west. I can truly say we live in "America The Beautiful." At the same time, we have problems, many quite universal as they apply to soil and water conservation. There is a need for better management and for remedies that will help meet deficiencies. There are arid regions with the need for a more adequate water supply, and wetlands needing better drainage and better protection from flooding. I have seen fertile lands washing away and poor lands producing no income, because of improper use. I have seen lands overgrazed and forest lands denuded unwisely of their timber.

Basically, however, our needs are similar. Most necessary is the will on the part of the people themselves to do more about soil and water conservation and to do it better. Once the spirit of conservation catches on, there is need for ade-



Wexford SCD women on conservation tour.

quate financing and technical help to assist the local people in moving forward toward their goals.

It has been stated before that the idea of conservation began as a vision, one which we, the women, wanted to help in becoming a re-

ality. I'm proud of the reports which come from the State auxiliaries.

These reports tell me that across the country there are increasing hundreds of women who are hard-working conservationists. They are informing themselves on the problems, programs, and opportunities of their districts, and their State and national associations. They are offering to serve in any way possible. In their homes, they are teaching their children conservation concepts; and on the farms and ranches they are encouraging their husbands in broader programs of conservation activity.

They are interpreting conservation and farm life to other women who are homemakers with the same everyday problems of feeding and clothing their families, and who are desirous of a higher standard of living and better recreation.

Many are assisting with the annual observance of Soil Stewardship Week. They are studying school curricula with an eye to conservation teaching. They help plan, and participate in, soil and water conservation projects of farm



A windbreak traps snow on Briar View Farms.

women's organizations, garden clubs, Extension groups, and other organizations. They are 4-H Conservation Club leaders, and work with the Future Farmers of America (of which I am a very proud honorary member), and with the Boy and Girl Scouts. I believe one of our most important efforts should be to do those things which will bring about the education of

our children in conservation of our natural resources.

At the same time, we must not forget the conservation education of the adults, both men and women, both rural and urban. My work as a district aid has given me the golden opportunity of working with all of these groups, plus radio, TV, and newspapers. It is our job to have them understand that our

land and water are basic to the support of individuals, their families, and their communities, their schools, churches, and other institutions.

It is our job to tell the "Conservation Story." It is our desire to work together, to help translate the bright vision of conservation on the land into fruitful reality—now and for years to come.

Wives Help Make Irrigation Studies

By Robert A. Sidner

QUENTIN Hittle, Sr. of Davidsonville and Charles F. Stach of Odenton and their wives are helping tobacco farmers in the Anne Arundel Soil Conservation District of Maryland to obtain needed irrigation information.

Two plots of tobacco, one on each farm, represent widely different

kinds of soil, each of which has been carefully tested to find its waterholding capacity and what part of this water is available for plant use. These field trials are conducted by using a procedure similar to the running balance carried in a checking account. The deposits are water from rainfall and irrigation. The withdrawals are from the sun, wind, and plant use.

Mrs. Hittle and Mrs. Stach help their husbands by making daily readings to determine the average temperature, hours of sunlight, and rainfall, if any. They also record the amounts of water applied when the crop is irrigated. Each day, the balance is adjusted to show the deposits or withdrawals. Irrigation water is applied when the balance reaches a figure determined to coincide with wilting of the tobacco, to bring the balance back to field capacity.

These trial results are carried on throughout the growing season, and are correlated with comparable fig-

ures obtained by farmers in other counties in Maryland and elsewhere in the northeastern United States. Use of irrigation to intensify crop production has gained wide acceptance in recent years. Field trials like these provide a guide for future proper conservation water management.



Mrs. Stach checking in the field.



Mrs. Hittle recording information she has gathered.

Note:—The author is work unit conservationist, Soil Conservation Service, Annapolis, Md.

“Women in Conservation Are All Alike— They All Are Doing Their Part”

By Ruth Williams

(Note:—This “women in conservation” issue of *SOIL CONSERVATION* would not be complete without this personal observation by the wife of SCS Administrator Donald A. Williams, one of the many wives who have been through the soil and water conservation ranks with their husbands. A South Dakota farm girl, she has since 1935 shared with him, and with the wives of the farmers and ranchers with whom he worked, the fight against soil erosion and water waste—lived and “preached” conservation from coast to coast.—Ed.)

IT was the spring of 1932 and I was on my way from Aberdeen to Clark, S. Dak., to see my prospective husband. It was spring and like James Russell Lowell’s poem:

“Now is the high tide of the year . . . And whatever of life hath ebbed away . . . Comes flooding back with a ripply cheer . . . Into every bare inlet and creek and bay . . . And . . . No matter how barren the past may have been . . . ‘Tis enough for us now that the leaves are green.”

But the poem we memorized back in the 5th grade just didn’t make sense this spring morning. Another “black blizzard” had just roamed through the Plains States and had again left it a sea of desolation. There were no songs of the birds to herald the morning, for birds must have water and cover. There was neither—only powdery dust.

The road passed through miles of once fertile fields and pasture—now a vast nothingness—broken down fences half buried in dust, trees trying desperately to put forth a few leaves—that is if they still survived. We were stopped at the railroad crossing as a long

train of cattle cars filled with bellowing, bawling, half-starved animals on their way to Omaha or Sioux City crawled past. They should have been in green pasture with new calves.



Ruth Williams.

Along the road were farm houses, once painted white with organdy curtains and potted plants in the window. Now they are like the landscape about them—grey and forlorn, and some abandoned. The man at the next filling station, once a farmer, muttered: “I just can’t take it any more.” Even “hope” for many had become a meaningless word.

The “Dust Bowl” was only one of Nature’s rebellions against man’s misuse of her resources. For example, I remembered the little city of Vanport, Oreg., destroyed in minutes by a flood on the mighty Columbia River, made mightier by uncontrolled water runoff from melting snow on the watersheds. Then there was a lovely little lake

back from the coast a mile or so—where Don actually caught fish. A clear-cut logging outfit had raped the bordering mountains, leaving the slashings. Fire followed, and then flood silt drained into the lake, and it no longer had an abundance of fish. And who can forget the Tillamook Burn in the Cascade Mountains in Oregon. Thousands of Douglas fir trees lay waste—a scene as desolate as the Dust Bowl itself. And how about the strip-mining spoils and debris in the Appalachian Mountain country at the other end of our great country?

These are all dreary pictures we would like to forget, as we would like to forget the week of October 19, 1962, with its possibility of laying waste our Nation. But we dare not forget! It often takes disaster or near catastrophe to start a movement for a better way of life. So it was that out of disaster the Nation’s modern soil and water conservation program as we know it today was born 30 years ago.

Men everywhere joined in the movement and with them, as the coworkers, the moral support, the “power behind the throne,” the “no dollar a year gal”—the *women!* I have yet to meet a wife of a conservationist or of a conservation farmer or rancher who was not a conservationist in her own right. She may not build stock ponds, terrace the hills, or make contour furrows; but I’m sure she’s approved his conservation program, pushed it, preached it, and cut the budget so it could be done.

There is no greater pleasure than to go with Don to conservation meetings. It doesn’t matter which State you go to, the women in conservation are all alike. They all are dedicated and are doing their part



Vanport, Oreg. (between Vancouver, Wash., and Portland, Oreg.) grew up in early 1940's to serve World War II industry workers and was destroyed by this flood in 1948.

in conservation.

the National Association of Soil and Water Conservation Districts.

We have a Ladies Auxiliary of

From Swimming Champion To Conservation Farmer

By Robert F. Tegner

WHEN Florence Chambers was a girl of nine adversity put her on the road to becoming a champion swimmer. A quarter of a century later, adversity put her on the road to conservation farming and made her one of its staunchest champions.

Water has been as important in the latter phase of the life of this San Diego and Escondido, Calif., businesswoman as it was in her earlier stardom. As a swimmer, she overcame a back injury and went on to star in the 1924 Paris, France, Olympics after numerous conquests in the United States. As

a conservationist, she served for 10 years as secretary to the board of supervisors of the Pomerado Soil Conservation District. A technicality of legal residence had prevented her being a supervisor, although she was elected to that position.

A fall on a streetcar in 1917 injured Miss Chambers' spine. Doctors had just about convinced her parents to put the girl in a cast, when one suggested what was then the little-known method of water therapy.

"I spent hours in the water," Miss Chambers recalls, "and I became pretty good at swimming."

Miss Chambers won 157 trophies for open water swimming and more

It is an effective education arm of the Association; and there are growing numbers of State association auxiliaries, and even some local district auxiliaries. You will find the conservation women also have left their mark on the public school course of study, on the garden clubs, General Federation of Women's Clubs, League of Women Voters, 4-H Clubs, Girl Scouts, and Camp Fire Girls. You name it and, if by chance they missed, well, just give them time!

I knew a little Camp Fire Girl several years ago who could classify land like an expert. And I've heard more than one teenager proudly express the wish in typical teenage fashion that "Just once they'd like something dished out, other than conservation, at the evening meal." So you see this conservation movement is not "for men only," but a family affair.



Miss Chambers at 1924 Olympic Games in Paris.

than 300 medals for indoor competition. She was only 16 when she made the Olympic team, on which

Note:—The author is field information specialist, Soil Conservation Service, Berkeley, Calif.

she placed third in the backstroke. Later, Miss Chambers became a coach of champions, including Florence Chadwick of San Diego, who swam the English channel both ways.

Miss Chambers' parents were lured to California in 1886 by reports of the wonderful weather and the opportunities. Her father, who had been reviewing plays for a New York newspaper, joined the staff of a Methodist college in San Diego as professor of Greek and Latin.

Over the years, the Chambers acquired property including a 1,400-acre ranch in Poway Valley near Escondido. The ranch was leased to a cattle firm for years, but inheritance taxes threatened to wipe out the estate left when her parents died. While lawyers battled in the courts to save it, Florence Chambers went to work operating a dairy. She came out on top in both struggles. For the first time in her life, she also began operating farm machinery. This was in 1943, midway in the second World War when manpower was scarce.

One of the first bits of advice she heard in the farming community was: "If you don't know much about farming, go see the Soil Conservation Service and find out what you need to do with the land." Obviously, her land used for grazing needed some changes for dairying.

Miss Chambers became a cooperator in the Pomerado district (recently consolidated with another to form the Penasquitos SCD), and soil and water conservation acquired a new champion—a fighting champion. It wasn't long before she was working with supervisors as board secretary.

What was needed to build up this farm was the same thing she needed as a girl—"water therapy." Wells were not providing enough water; so with technical help of the SCS, Miss Chambers had a reservoir built to store runoff rainwater. She later built two more, one fed by a spring. More recently, she gave up some of her Poway Valley land to a sewage treatment plant, receiving rights to the water from the plant to store behind another dam.

Early in her farming career, Miss Chambers set out to buy a herd from a local dairyman going out of business. She wound up buying the whole farm—the 1,300-acre Cloverdale Farm. She has been less fortunate thus far in her search for water for this farm; but she has worked hard to develop it along good conservation lines, including installation of a double-dam barnyard drainage project.

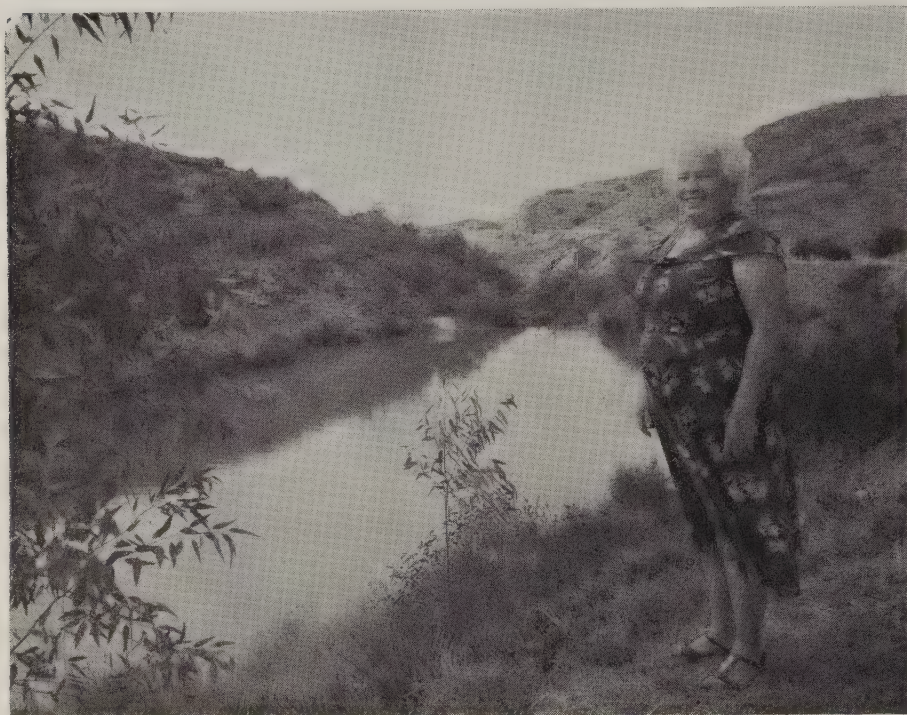
To supply hay and grain for her herd, Miss Chambers developed about 100 acres of cropland on the Poway Valley farm and about 300 acres on the Cloverdale Farm, using sprinkler irrigation. Her other conservation activities have included rangeland grass experiments and a big brush-clearing project to reduce fire hazard and increase range feed. Today, Miss Chambers is leasing the dairy operation and concentrating on raising replacement heifers for dairy herds.

Meanwhile, about 400 acres of her Cloverdale Farm was taken over by San Diego for a reservoir that never developed, and some of her Poway Valley farm has been sold to friends and to the sewage district. But another force has been creeping around Florence Chambers' Poway farm in recent years — spreading suburbia. Although she has stoutly stuck to her farm, she recognizes that "taxes are so high, I can't afford to keep it in agriculture."

With friends and advisers, she has formed a corporation to take over Poway. Recreation looms high in the plans. Already off the drawing board are plans for a golf course. Other recreational developments may include trout fishing facilities and pasturage for riding horses. Subdivision also is included in the plans.

But Florence Chambers is still one of conservation's strongest boosters.

"Soil and water conservation is the salvation of agriculture," she will tell you. "We just couldn't do without it these days."



Today's Florence Chambers by reservoir impounding water released from sewage treatment plant on Poway Valley farm.



Mabel H. James.

A DEVOTED advocate of the conservation of the soil and other natural resources is Miss Mabel H. James of Holland, N. Y., who has multiplied her influence in conservation by teaching others to become conservationists.

Miss James says that to learn about conservation you must get out of doors. It was hiking with children of the James' household and neighborhood youngsters that started her on her own career in conservation. As a result, she developed into a naturalist well acquainted with her environment, and became proficient enough to become naturalist for the Garden Center Institute of Buffalo.

It occurred to her that some adults also would like to be taken on guided hikes. The still active Buffalo Hiking Club had its beginning in Sunday hikes Miss James started after she graduated from Holyoke College in 1909.

Miss James has been Research Associate in Conservation for the Buffalo Museum of Science since

New York Woman Is Conservation Leader

By Homer E. Stennett

1941. Her interest in conservation was reawakened in the early 1930's when she read articles by Dr. Walter C. Lowdermilk, then of the Soil Conservation Service, and Writer-conservationist Russell Lord. This new knowledge she taught to her hikers, school groups, garden clubs, and others.

She had long noticed that many groups were interested in conservation, but that they were doing little about it. So she began the work which, she thinks, has been the most significant. She helped to organize the Conservation Forum of New York State in 1939. She was corresponding secretary in the early years and now is chairman.

The Forum is a federation of all

kinds of groups, such as garden clubs, conservation clubs, and chapters of the Izaak Walton League. As many as 60 groups have supported the Forum, and its printed reports are sent to more than 250 members. Several other chapters have been organized elsewhere in New York. The aim of those belonging to the Forum is to educate themselves about conservation matters and to influence others. Through the years, special effort has been made to enlighten legislators in their consideration of conservation legislation.

The Forum's first and continuing interest was the conservation of soil and water. Through the years, however, the people in the



A "Conservation Caravan" visiting Great Brook watershed in Chenango County, N. Y.

Note:—The author is area conservationist, Soil Conservation Service, Wellsville, N. Y.

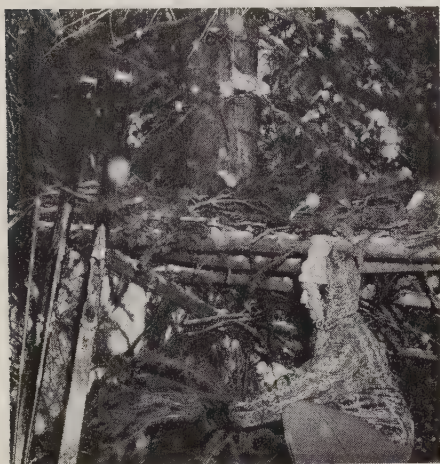
Forum have studied and voiced their opinions about related subjects such as clean streams, wildlife, public parks, forests, and the New York State Forest Preserve. At the moment, the Forum is concentrating on the protection of the golden and bald eagles, which are threatened with extinction. Today, Miss James finds, the general public has a greater knowledge about conservation, for which she says the Forum can take its share of credit.

Each year for 14 years Miss James has conducted a weeklong conservation caravan of 30 or so people through the eastern United States by bus. She always plans to visit several soil conservation farms and watershed projects on the tour.

Through the Buffalo Museum of Science she also conducts a yearly poster contest in conservation. She writes much and lectures often. She has helped with campaigns to raise funds for the purchase of land and

water areas that have special value to conservation. She is a trustee of the New York Chapter of Nature Conservancy, has been a trustee of the American Nature Study Society, and is a member of the Audubon Society, the Community Council, and the Holland Planning Board.

She is proud that in 1962 the Mabel H. James section of the Conservation Trail was dedicated. This hiking trail will extend from Pennsylvania to Lake Ontario.



The author preparing her bivouac in a snowbank.

IN the irrigated valleys of Wyoming most of the water comes down from the high mountains where it has been stored as snow through the winter. Farmers and ranchers use the water according to their "rights." This means that in years of subnormal yields, water users fare according to their established claims to water available.

We who serve as hydrographer-commissioners in Wyoming have the job of administering water supplies according to these priorities. We rely heavily on the information we get from snow surveys, reports that indicate how much water we can expect from streamflow in the irrigation season.

I have known about snow surveying for many years. The program started in Wyoming in the 1930's when my husband, Ernest, and I still were engineering students at

First Woman

Braves Snow Survey School

By Rachel LeVasseur

the University of Wyoming. In those days, he, accompanied by Paul Petzoldt, renowned mountain climber, or some equally sturdy volunteer, traveled by car as far as possible and then finished the trip on skis to the snow stake at the foot of Medicine Bow peak. I figured the field notes when they returned. The U.S. Forest Service rangers also assisted as the program began to develop, prefacing the present day surveys under Soil Conservation Service guidance.

About 6 years ago, Ernie and I took to the air to check snow depths on inaccessible snow markers. He piloted. I made notes.

Somewhere along the line I learned the art of oversnow travel and snow sampling, which were to become, eventually, such a valued part of my experience and my work as river basin operator.

However, the advanced theories of snow surveying, the hazards that are always near, and the newer techniques that are coming into use—these I had not yet encountered. Therefore, it was with sincere interest that I enrolled, with approval of State Engineer Earl Lloyd, in the sixth annual West-wide Snow Survey Training School

at Winter Park, Colo., in 1962.

I had expected my application would arch some eyebrows—and it did. No woman had ever before taken the training. I confess I did not have a clear idea of just what the curriculum would involve, but my enrollment was received by the sponsoring Soil Conservation Service with magnanimity.

There were 97 trainees from the 11 Western States and British Columbia in which snow surveys are made monthly each winter. Many of them came from cooperating agencies—the Forest Service, U. S. Geological Survey, Agricultural Research Service, Park Service, Bureau of Reclamation, and the Dominion Water Rights Department.

The next 5 days were as busy and action-packed as any I have ever spent. Lectures and practice periods were correlated with outdoor training. We studied the theory and factors that are involved in runoff water forecasting, the principles of planning and water management, winter safety and first aid, snow sampling and

Note:—The author is hydrographer-commissioner for the Laramie River Basin in Laramie, Wyo., and member of State Engineer's staff.



Instructor making snow survey test for one group of trainees.

note keeping, and research in the snow survey field.

Out of doors we practiced on skis and snowshoes, making a 3-mile cross-country trek on skis. We sampled the snowpack and figured water equivalents and soil moisture. We practiced the art of winter health and survival.

One thing required of all trainees was an overnight bivouac near the 12,000-foot Berthoud Pass summit. With the temperature at night sinking to minus 20°, I am sure the school directors expected me to plead an excuse. I didn't. But it was an unforgettable experience.

Finding a likely depression in a snowbank, you insulate it with evergreen boughs and then, when you crawl into your down-filled sleeping bag, you carefully take your ski boots inside the bag with you. It is vastly important to keep boots and clothing dry. Keep dry and you'll keep warm. The chances are you will sleep snugly. I did.

Several things stood out as I progressed through the course. Perhaps the most obvious was the importance of reliable measurements and information in snow survey-

ing. Only the snow surveyor—and no one else—goes out and gets these facts.

Also, I detected an accent on

the urgent need for more research in this field. High elevation snow laboratories and many more precipitation stations are needed to supplement the current field data. Snow, alone, does not tell all the story. Remarkable work already has been done, including the association of climatological records with water yields. High altitude photography, such as Tiros, beggar the imagination of what the future can unleash for the researcher.

I learned how important it is to recognize hazards in snow surveying and to avoid them. Safety in snow surveying comes from learning how to live with hazardous surroundings.

The school was a rigorous but thoroughly exciting and inspiring experience. Do it again? Of course I would. I expect to. Whenever I figure water deliveries now, there will be a new concept in the back of my mind of the painstaking work that goes into the forecast information, and of the training and principles that underlie snow surveying wherever it is done.



The author has some fine points of snow surveying explained to her by fellow members of the training group, James J. Steele of Idaho (l.) and Robert L. Werner of Colorado.

Clubwomen's Conservation Motto:

By Mrs. M.



Mrs. M. Lewis Hall.

THE General Federation of Women's Clubs with its history of concern for both human and natural resources is well fitted for the role of bringing about public understanding of community and national needs.

There are Federation resolutions covering all phases of conservation. Thus we see that our organization has not only been alert to the changing times, but vocal as well. We must do more in conservation, however, than just sit back and enjoy the honor of being a member of such a farsighted organization. That is why the Federation's Conservation Department has the following goals as guides to our 1962-64 efforts in this vital field:

(1) Informed action based on the knowledge that our way of life and our very survival depend on wise use of earth, air, water, trees, and wildlife.

(2) To know and assist in solving the conservation problems of our home States and regions.

We have conquered our continent and exploited our resources. Being "use minded" and practical people, we have proceeded to use resources as if the population of the United States were small and the natural resources were never-ending riches. We do not see Nature as the Indian might—as one continuing circle in which man and sky and earth and water are working, cooperating parts. Yet, there is a growing interest in ecology—the study of the interrelationship between organisms and their environment.

With so much being said and written about who will reach the moon first, space is uppermost in most people's minds these days. We clubwomen must remember—and use in our club programs—the fact that before we go up, we must

go down in the earth for raw materials. For those of us who remain earthbound, we too have a problem of space. The ground under our feet—the most important space in the world—is disappearing at an alarming rate. Of even more concern than outer space is the space that is left here and the use man makes of it.

It is urgent that we understand the pressures which are changing our conservation environment, and in that way, that we fully comprehend our conservation responsibilities. The pressures are: first, population growth—the number of metropolitan areas is increasing, and the suburban area outside the central city is the main growth area; and second, the decrease or pollution of resources. Since many demands are made upon most resources, this is an area where we must work together.

Water, for example, means life



Contour stripcropping is one of the conservation measures that help keep this farm near Pennington in New Jersey's Freehold SCD productive and prosperous.

Note:—The author is chairman of the Conservation Department, General Federation of Women's Clubs, Washington, D. C.

'Do More Than Just Sit Back''

vis Hall

—and recreation—and sometimes pollution. Again, the wise use of water resources needs the participation of many concerned people: the farmer, the fisherman, the boatman, the industrialist, the homeowner, the swimmer. The water problem is twofold: uneven distribution and pollution.

With careful management, resources can be used by people with a variety of outdoor interests. Multiple use is a familiar term, especially in connection with our forest resources. Both the U. S. Government, through its national forest program, and private tree farmers are encouraging the use of forests for timber, recreation, forage, and wildlife and water.

Grassland areas have received careless treatment in the past, but modern conservation farming methods are restoring them. In the rich Midwestern land, impatient settlers plowed up the grasses which helped

hold the soil together. It required not many years before the fine topsoil was blowing off with the wind and washing away with the rain. Stripcropping, terracing, and contour rows are used together or singly to hold the water long enough to seep in the soil. Much of the grasslands area is grazing land where careless overgrazing—again the error of not leaving enough for tomorrow—can lay the land bare for generations. The need for balance between the “carrying capacity” of a piece of land and the human needs for livestock products is demonstrated.

Enjoyment of our resources through recreation is another use. In the field of outdoor recreation there are significant new dimensions; a growing population, more leisure time and movement of people to the cities have combined to bring about problems and a challenge. Man likewise is taking an

active part in the life cycles of the other living creatures in the conservation picture; the business of wildlife management includes changing the natural environment to help produce a sustained annual crop of wild game for food and recreational purposes.

As Federation President Mrs. Dexter Otis Arnold pointed out in her installation message, “Assignment for the Sixties,” last June:

“A drop of water, a small clod of earth, our oil, gas, iron, fissionable fuels, animals, mountains, forests, lakes—Unity in Diversity—the glories of America bound together under the name of conservation. There is a need for a deep realization of our veritable survival in that word conservation. Based on the premises that conservation is the wise use of renewable and nonrenewable natural resources, conservation becomes not just a term, but a way of life. We will strive for multiple use in resource development with private enterprise and Government assistance in an effort for the greatest good for the greatest number for the longest possible time . . .

“Our natural resources are interdependent and interrelated, and they need to be considered and understood in this perspective. By studying the area conservation problems, experiencing special Conservation Days in every State and becoming acquainted with a telescoped conservation program, an interest in comparative concerns may be more fully developed and better understood for a more forceful and effective program. Conservation concerns our economy, our nutrition, our recreation, and our very way of life.”



Livestock water, recreational facilities, and gully control are among dividends paid by this 1-acre pond on L. T. Haden farm in Callaway County, Mo. Hadens are discussing conservation farm plans with Cleo H. Statton of SCS (l.).

Puerto Rico's Mrs. Torres Preaches—Practices Conservation

By J. F. Marrero

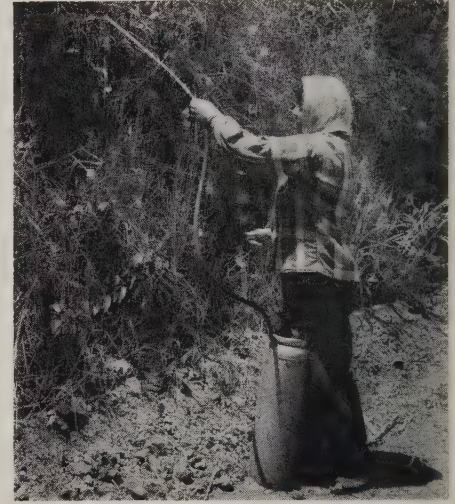
IN a land where for generations woman's place was in the home Mrs. Rosa Torres emphasizes the increasing role of the women of Puerto Rico in every activity formerly the province of the man.

Mrs. Torres owns and operates two farms, the family farm of 41 acres where she was born, and another of 14 acres. Most of the 55 acres is planted to sugarcane, and under her supervision all of the soil and water conservation practices required have been established. They include contour planting, crop residue management, establishment of water-disposal areas, and farm roads built on the approximate contour. About 5 acres is in forage grass.

Mrs. Torres is a soil conservation

leader in her community in Barrio Santana, Sabana Grande. She is also a member of the local Extension Service Advisory Planning Committee and takes an active part in preaching the gospel of soil and water conservation throughout the community. "Preaching" is the correct expression, because she has tremendous faith in all matters concerning soil and water conservation.

Rendering community services comes naturally to Mrs. Torres. Upon her graduation from Ponce High School in 1920, she became a rural school teacher. She quit to attend Columbia University in New York City and received a B. A. degree in 1947. Upon graduation, she returned to Puerto Rico



Mrs. Torres spraying chemical weed-killer on sugarcane field border and roadbank.



The conservation plan for her sugarcane farm is the subject of a field discussion by Mrs. Torres with the author (L.) and SCS Work Unit Conservationist Alfredo Ramirez.

and was appointed instructor and professor of history at Interamerican University at San German. She taught there until 1959, when she retired to devote all her time to farming. During her 12-year teaching career, she had spent all her spare time on the farm.

Mrs. Torres supervises all farm operations and personally performs many of the operations of a sugarcane farm such as planting, fertilizing, harvesting, and operating a power winch for loading cane onto trucks for transportation to the Guanica sugar mill.

The Suroeste Soil Conservation District in which Mrs. Torres' farm is situated is in the southwestern part of Puerto Rico, in the semi-arid region of the Island. When the author and a Soil Conservation Service technician working with the district visited the farm, Mrs. Torres, wearing blue work slacks and shirt with a handkerchief over

Note:—The author is soil conservationist, Soil Conservation Service, Santurce, Puerto Rico.

her hair to protect it from the hot sun, was using a portable sprayer with a chemical weedkiller on the sugarcane field borders.

She plans eventually to change her farming enterprise from sugarcane to grassland for beef production, because continuous cultivation of sugarcane on her limited acreage places too great a strain on the land. In addition, obtaining sufficient labor for cane harvesting is becoming more difficult,

because of the seasonal migration of farm laborers to the eastern United States.

Mrs. Torres' enthusiasm for soil and water conservation, her interest in civic activities, and her energy for hard farmwork, have been a revelation to the residents in Barrio Santana. All her neighbors respect her as a leader who teaches them how to improve community affairs, not only by talking about it but by actually doing the

work herself.

Whether supervising the operations of her farms or addressing a civic group or farmers organization, Mrs. Torres is completely at ease. She is in demand as a public speaker. But more than anything else, she is an outstanding example of the role and progress Puerto Rican women have achieved in the everyday struggle for self-improvement, leadership, and service to the people in Puerto Rico.

Homemaking—Natural Resources Are Closely Related

By Mrs. Richard S. Thompson

THE conservation of life is a natural instinct in women and all life depends on the conservation of natural resources.

It is not difficult for me to understand why women should be active in conservation. I have been active for several years. It has become a way of life in our family. My husband and I are both active in conservation on our farm. Also, we serve in conservation work as officers in State and national organizations of soil conservation districts. We are so enthusiastic about conservation of soil, water, woodlands, and wildlife that we can't really understand why everybody is not actively engaged in some kind of conservation effort.

It seems to me that women everywhere should be aroused about conservation, since they are the homemakers of our country and natural resources are so closely related to the home and the family. Food, shelter, water, and clothing are all products of natural resources. This is true for all of us, whether we live on a farm in the Lower East

Red River Soil Conservation District, as I do, or in a city like Baton Rouge or New Orleans.

Conservation and wise use of soil has brought us a standard of living unsurpassed in history. Our food

quality food at reasonable prices. Also, they have freed a large proportion of our population from producing their own food so they can work in industry, professions, or other endeavors. In some countries, a large percentage of the total population is engaged in agricultural production. In the United States, one farmer produces enough for himself and 26 others.

You know about water. It's something you drink, cook with, or bathe in. Water also can be fun for swimming, boating, fishing. But do you realize that our farms require great quantities of water to produce food, fibers, and the raw materials which agriculture provides for industry?

The tap in your home, the water main to your factory, the fire hydrant on the corner, your favorite farm pond, and irrigation pipes and canals all carry water that has flowed across the land of a watershed or seeped deep into natural underground storage reservoirs. Farm and city people alike, therefore, should look beyond the water cooler to the watershed; for we all are involved in the use, development, management, and conserva-



The author and daughters Barbara (l.) and Ellen study Women's Clubs conservation kit (p. 136).

abundance is the envy of the world. Conservation farmers have played a vital role in providing the homemaker with this abundance of high

Note:—The author is area vice-president of the Ladies Auxiliary of the National Association of Soil and Water Conservation Districts for the Gulf States, Colfax, La.



The kit of "Soil and Water Conservation Program Ideas for Women's Clubs" displayed by Joe Anne Blanchard of Louisiana State University.

tion of watersheds.

Fortunately, progress is being made in solving the problems of too much and too little water in Louisiana through the watershed protection and flood prevention work of the Soil Conservation Service in cooperation with soil conservation districts and various community interests. This is a local program with Federal help, and that is good. Water problems are local, but they are of equal concern to farm and city people.

Rapid progress also is being made in increasing production of usable timber products. Woodland owners in Louisiana have planted more than 1,000,000 acres to pine and desirable species of hardwood. These trees also provide erosion control and watershed protection. Soil conservation districts have been extremely active in helping farmers plant pines and apply woodland and other conservation practices. Because most of our wildlife crop is grown and harvest-

ed on land used mainly for cultivated crops, livestock, or wood-products, farmers and ranchers likewise are the key to abundant wildlife and fishing.

A kit of "Soil and Water Conservation Program Ideas for Women's Clubs," prepared by the Soil Conservation Service, is being well received by women in Louisiana. This kit has been provided to officers and other key leaders in the Louisiana Federation of Garden Clubs, Louisiana Federation of Women's Clubs, Louisiana Federation of Business and Professional Women's Clubs, Louisiana League of Women Voters, and to numerous individuals.

About 200 copies were made available to officers and key members of the Louisiana Federation of Garden Clubs at their annual meeting last August. Mrs. George Beall of Alexandria, conservation chairman, challenged them to have at least 400 programs on conservation at garden clubs in the State in

1963. Conservation objectives listed by Mrs. Beall are: (1) Get more conservation taught in schools; (2) emphasize water conservation, management, development, and wise use; (3) cooperate in observance of Soil Stewardship Week each year; (4) know about soil conservation districts and cooperate with their supervisors; and (5) protect rare native plants on the garden club list.

The kit contains information about these topics: The Club Woman and Conservation, Women in Conservation, Appropriate Conservation Objectives for Women's Clubs, What Women in Clubs Can Do to Help Promote Soil Conservation, Suggested Program Topics, Shall Louisiana Be the Less?, and Keep Louisiana Green. It also contains several prepared talks and charts to illustrate these topics, and other program ideas and aids.

"Natural resources are gifts from God, but it is up to us to use them wisely," Mrs. Samuel Levy, chairman of the Conservation Department of the Louisiana Federation of Women's Clubs, Natchitoches, aptly says. "Trained technicians in Louisiana are teaching us the wise use of soil, water, forests, and wildlife. To be well informed on the status of these resources is the first step in good conservation. Our greatest concern is with soil and water. But, we must keep in mind the interdependence and interrelationship of all renewable resources. If the clubwomen of Louisiana would work together, we could have a 'lovelier Louisiana,' and we could make conservation of natural resources a part of everyone's life."



The Perry County, Ark., SCD has placed a conservation bookshelf in each of the county's 17 schools. The National Association suggests this as a project for the District Ladies Auxiliary, "where the men haven't the time or inclination to deal with this opportunity."

SCD Director's Wife

Is Conservation Salesman

By Charles Slaton

FIVE years have gone by since Chairman Rudy Ludwig of the Pike County Soil Conservation District asked his wife to take a few notes at a district meeting. Since then Sophie has traveled thousands of miles, attended scores of conservation meetings, and kept the books for the district.

To many soil conservation district officials in Pennsylvania,

tion Service personnel with having prompted a number of farmers to become district cooperators.

They also consider her interest in watershed protection and flood prevention work a great help. The early Green Dreher watershed meetings she and Rudy held helped pave the way for getting some of the land rights, and social visits they have made into the watershed also are paying dividends. A movie Sophie is developing, which will document the watershed work in the county, will be valuable in future watershed work in north-eastern Pennsylvania.

Soil Stewardship Week is another of Sophie's projects. Largely through her efforts, the county's clergymen have become acquainted with the district's Soil Stewardship activities, and her other planned Soil Stewardship Week activities also have brought results.

A former school teacher, Mrs.

Ludwig believes there are many conservation lessons yet to be learned. Getting more women interested in the land and its care is one.

"I would like to see more women district directors, particularly in Pennsylvania," she says, "but it is even more important that the lady of the house know the values of conservation. Many good farm plans would have been put on the land sooner if she were better informed about the benefits of the plan. We've made some progress here, but there is a long way to go before conservation is a dinner table subject."

Sophie Ludwig devotes endless hours to district work, despite the fact she is a full-time employee of the Delaware River Joint Toll Bridge Commission and Treasurer of the County Extension Association, is active in many community projects, and helps run the Ludwigs' 70-acre fruit farm.



The Ludwigs—husband and wife conservation team.

Sophie Ludwig is an old acquaintance. She hasn't missed many Executive Council meetings, and you can always count on seeing her at the Annual Conference of the Pennsylvania Association of Soil Conservation District Directors. But it is in Pike County where Sophie is best known for her work in conservation.

In addition to being secretary and treasurer for the Pike County district, Sophie has developed a productive information program. The district's quarterly newsletter, which she is a prime mover in preparing, is credited by the directors and assisting Soil Conserva-



Conservation on the land on Allen Hess farm in Columbia County, Pa.—contour crop strips, farm pond and diversions, sod waterway, and other measures.

Note:—The author is assistant to the State conservationist, Soil Conservation Service, Harrisburg, Pa.

Minnesota Daughters of the Soil

Mark Decade of Conservation Education

By Herbert A. Flueck

A DECADE of effective educational work in behalf of soil and water conservation is its own reward for a dedicated group of rural women known as "The Minnesota Daughters of the Soil."

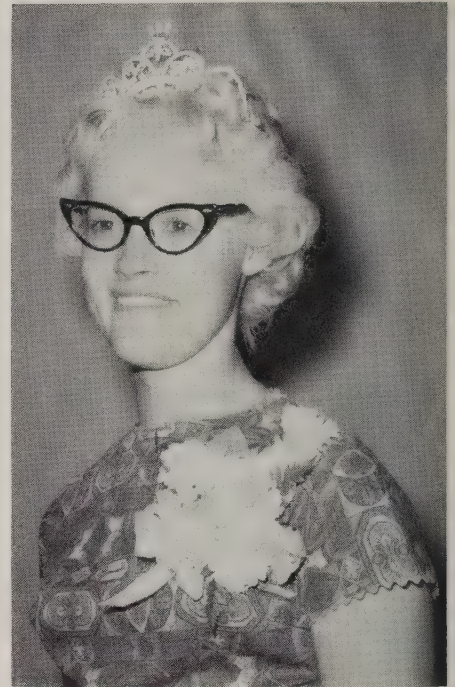
This North Star State group, of which Mrs. Del Krenik of Madison Lake is the sixth president, was one of the earliest of similar organizations to be formed in a number of States. Working closely with soil and water conservation districts, it sponsors conservation activities ranging from high school speaking contests to plowing match beauty queens.

The Minnesota Daughters of the Soil was officially organized in 1952, following the pattern set by a group of soil conservation minded women in the Freeborn County Soil and Water Conservation District at Albert Lea.

The Daughters of the Soil recog-

nized the need, however, for a more formal organization and in 1953 enlisted the help of Executive Secretary Matt A. Thorfinnson of the State Soil Conservation Committee in drawing up a constitution and bylaws. The Daughters also decided to affiliate with the Minnesota Association of Soil and Water Conservation Districts. This was a natural move, because the founding members were wives of the Association's directors.

Besides attending a number of directors' meetings and area and State association conventions, the ladies already had some experience in carrying out soil conservation work, as their husbands had asked them to take over the leadership of several district educational projects. It was their success in this activity that had led directly to their decision to organize the Minnesota Daughters of the Soil. Also



Joyce Andreas of Montevideo, Minnesota's 1961 "Queen of the Furrow."



Minnesota Daughters of the Soil as hosts for 1962 NACD Auxiliary leaders at Minneapolis: Front row (l. to r.): Mrs. John Harmon (Mich.), Mrs. Alfred Stewart (Iowa), Daughters' President Krenik, and Mrs. Leroy Viehman (Wis.). Back row: Mrs. Archie McIntosh (Ill.), Mrs. Max Huss (Ind.), and Mrs. Roman Henkels (Minn.).

as a result of these activities, the president of Daughters of the Soil now sits as an ex-officio member of the board of directors of the Minnesota Association.

Every year since its activation, the Daughters of the Soil has sponsored the "Minnesota Queen of the Furrow" contest. Each year, the queen has ruled over the Minnesota soil conservation field days and "Plowville" matches, beginning with 1952 when Plowville was the site of both the Minnesota State and the national plow matches attended by more than 100,000 people. In addition, the Daughters of the Soil sponsor all the official activities for women during the State Plowville matches.

As a beginning activity for its

Note:—The author is State conservationist, Soil Conservation Service, St. Paul, Minn.

second decade the organization is cosponsoring, with the State districts association, a public conservation speaking contest for junior and senior high school students.

The topic, "Soil and Water Conservation—Will It Affect My Future?" will be the theme for speeches in soil and water conservation districts and State associa-

tion area organizations throughout Minnesota. The Daughters obtained permission from the State Department of Education to work through the schools.

League of Women Voters Promotes Political Action For More Water Resource Conservation

By Mrs. Robert J. Phillips

PRESSURES put on our national resources by an expanding population led the League of Women Voters of the United States to decide in 1956 to work on conservation of water resources on a national basis.

Like an increasing number of citizens, League members had become alarmed over this situation. They wanted to learn the facts and to be prepared to take action on suggested remedies.

During the last 6 years, they have learned a great deal—not only about wise resource management but also about the political realities of achieving desired results. They have learned, for example, that choices have to be made among competitive uses, many of which are legitimate, attractive, and worthwhile in themselves, but which cannot all be accommodated.

Comprehensive development in which each specialized interest is considered and given its place in a reasonable, coordinated, cooperative program can be achieved only if there is deliberate, systematic, intelligent, imaginative planning and cooperation on all levels—local, State, regional, and Federal—and among all factions interested in soil, water, forest, and wildlife resources.

The increased and really contra-

dictory demands—for increased production of our natural resources



Mrs. Robert J. Phillips.

and at the same time for more areas preserved in their natural state or made inviting for recreation—make it imperative that there be a like increase among those who have a real concern for natural resources and who are willing and able to translate that concern into effective action.

Most political scientists seem agreed that people in a community who will take the trouble to learn about issues, vote in referenda, support candidates on the basis of

their platforms, express themselves aloud on political issues—in other words, those most likely to take an interest in conservation measures—are members of citizens organizations or civic groups. Indeed, it is often through these organizations that the members become aware of and knowledgeable about community problems.

One way to enlist more citizens in active work for our soil, water, forests, and wildlife is, then, to bring more people into conservation-minded organizations such as the Soil Conservation District groups, the Izaak Walton League of America, the Garden Club of America, the 4-H Clubs, the Boy and Girl Scouts, the Future Farmers of America, and others.

Another way is to interest existing citizen organizations not now conservation minded in supporting conservation programs. Such civic groups can perform a most useful function in complementing the views of those with special conservation interests. For it is quite true that sometimes strong organizations devoted to one resource use seem more intent on checking some other worthwhile use of this resource than in forwarding a total conservation program. Here is where the disinterested citizen group can fit in. Laymen can listen to the conflicting view of the pressure groups and help to balance the special demands. They can do

Note:—The author is president, League of Women Voters of the United States, Saint Charles, Ill.



Water for irrigation is only one of many uses of this precious resource here in Benton County, Wash., in the Columbia Basin.

this, of course, only after they have learned the facts.

As members of the League set out to become informed in the field of water resources, they found a dearth of material in simple, usable form to give the citizen the background he needs for intelligent participation in political decisions. What the citizen needed was a combination of geographical facts, present and future human needs of all kinds, the governmental organization, and the solutions proposed.

So Leagues in various river basins set out to bring together their own materials. It might seem impossible for a group of women, all volunteers, none of whom were geographers or resource experts or professional writers, to compile a sound study of as big a river basin as the Columbia, for example, but they did. They published the result in "The Great River of the West." In short order two printings sold out. Leagues in other river basins did the same thing. Among the publications issued are those about the Delaware, the Red River (Minn. and N. Dak.), and, most recently, the Susquehanna basins. At the present time an inter-League group is at work on a study of the Ohio

River basin.

Using a guide called "Know Your River Basin" League researchers looked for answers to questions like these:

What is your immediate watershed? Does local watershed management cover the many diverse local situations of soil, slope, cover, and climate? What are the basin's watershed problems: burned-over areas, grassland overgrazed, overlogging, soil erosion, sheet wash, gullyng? How many farms are under soil and water conservation practices? Which soil conservation farm practices remain to be established: contour plowing, deferred grazing, land preparation, strip-cropping? How many farm ponds have been built? How many idle or marginal acres are planted to trees and wildlife protection areas? How many acres of woodland have improved management plans?

Also, what agencies are concerned: Soil Conservation Service, Forest Service, Soil Conservation Districts, State Forester, Agricultural Extension Service?

These river basin pamphlets have proved useful to many people outside the League, including experts on water resources and men and women in public life; because in

them the Leagues have summarized stupendous amounts of material and have shown the relationships between different programs and points of view.

Not every layman—not even every League member—can participate actively in such a study; but almost everyone can listen to the experts, do some reading, make a few go-and-see trips, and discuss these matters with others. Although we cannot devote ourselves to consideration of wise resource management as the experts can, we can help the experts with bits and pieces of our time and energy. And sometimes we can be the connecting link between the expert and the public and between the public and the decision makers.

The expert, the citizen, and the politician all need each other to translate theories, plans, and blueprints for action into functioning programs. In united association there can be strength.



For the third consecutive year the Noble County Soil and Water Conservation District Auxiliary placed first at the 1962 Tulsa (Okla.) State Fair for "Outstanding Achievement in the Promotion of Soil Conservation." Judging was based on a scrapbook containing evidence of the year's work.

Each year, the Auxiliary sets up a "Plan of Activities," which is followed religiously.

Among the Auxiliary women's accomplishments for the past year were: Fellowship tea; poster, essay, and jingle contests for school children; equipping schools in the district with conservation materials; assisting with Soil Stewardship Week activities and a Conservation Fair; setting up a booth at the county fair; holding educational tours; and many other activities. Each year proves a challenge to them to include more in their plan of activities for promoting soil and water conservation.

S. C. District Clerk Does Conservation Homework

By Curtiss O. Steele

BERNICE simply *lives* conservation—it's a day-to-day concern of hers." This statement could be attributed to most of the people who know Mrs. Carl Hunsinger, clerk for the Pickaway County Soil Conservation District at Pickaway, Ohio, since 1959.

Carl and Mrs. Hunsinger have been cooperators with the district since 1952. Practices they have applied in accordance with their basic conservation plan worked out with the help of the Soil Conservation Service for their once badly eroded 206-acre farm include a conservation cropping system, gully control, diversion terraces, tile drainage, water diversions and sod waterways, farm ponds (one for gully control), tree and hedgerow plantings, and wildlife area development.

Ingenuity and imagination have led Mrs. Hunsinger to conservation accomplishment beyond that ordinarily expected of cooperators. For example, she has used discarded baler twine successfully as a mulch on critically sloping areas to help in the establishment of fescue; because, she says, "the small, hairy threads fix themselves to the soil particles at strategic times." She and Carl also have hauled stone from the creek to provide riprap livestock crossings in other problem areas.

Forty cows make up the Hunsingers' milking herd. Most of their cropland is in meadow for hay and rotation pasture. A relatively low acreage of corn is produced, followed by enough small grain for reseeding the meadows.

Every morning before she goes to work, Bernice helps with the

farm chores; and each evening finds her doing more outside chores before preparing supper.

Mrs. Hunsinger is most effective in enrolling new cooperators for the district. She "sells" conservation of natural resources with the enthusiasm of an evangelist. Whether it is at her desk, standing beside a gate in the Hunsinger barnyard, or out in a lush alfalfa-grass meadow, she is effective in telling her story. Thus she can describe the conservation soil survey for their farm with understanding. She explains how the soils are related to each other—how they must be handled for conservation farming.

Soil Stewardship Week is emphasized in all groups with which Bernice is associated, in her neighborhood and in the district. Her local church has a special Soil Stewardship service on Rogation Sunday, as a result of her influence.

The Hunsingers have one daughter, Joanna, a junior in the College

of Home Economics at Ohio State University. As a high school freshman, Joanna won the Conservation Essay Contest sponsored by the district. The judges commented that the essay reflected an amazing comprehension of the science of soil and water conservation.

The Hunsingers feel that practicing soil conservation on their own farm is one means of "demonstrating where we are," and that soil and water conservation is urgent, and plain common sense.

"Our experience has been that nature is a cooperative force," Mrs. Hunsinger says. "We do not waste anything that might be turned back to the earth in some manner. Newspapers or discarded Christmas trees make excellent gully fill. Waste wood is burned in our fireplace and the ashes used around fruit trees or in the garden. Food wastes are incorporated into the garden, or fed to birds. No vegetative matter is ever burned, except for fuel.

"We believe that eternal vigilance in educating others, especially our youth—as someone has said, to capture their imagination—is a charge that we who know have. We believe in the words of Liberty Hyde Bailey who wrote: 'One does not act rightly toward one's fellows if one does not know how to act rightly toward the earth!'"



Mr. and Mrs. Hunsinger standing in well-protected diversion ditch channel. Beyond SCS work unit conservationist (on ditch ridge at right) is a wildlife area and pond.

Note:—The author is area conservationist, Soil Conservation Service, Columbus, Ohio.

The Defense Rests— Ladies Are Conservation Jury

By W. L. Heard

LADIES, you have heard the case presented. Soils *do* affect our health. Water *is* vital to life.

I know what people like you mean to a community. I have seen leaders like you organize to correct many problems. In some communities, you have united to provide fire protection for valuable woodlands. In others you have sponsored essay contests for school children. You have promoted the planting of unsightly eroded roadbanks with trees and grass. And you have spoken out vigorously for measures that make Mississippi a greener, more beautiful, and healthful place in which to rear our children.

Without your efforts the work of the conservationist is seriously handicapped.

Public opinion—leadership from

the people—puts the vital spark of life in conservation. Consequently, I hope you will return to your home communities with understanding of Mississippi's needs in conservation—and with resolve to give of your talents to this cause.

I don't need to tell you people who have seen the gullies of north Mississippi that gullies can be healed. Nor do I need to tell you people of south Mississippi that diversified crops and proper land use can build a richer economy. Isn't it plain that we're going to have to farm these acres better—manage these resources carefully—and that this is a matter which affects each one of us wherever we live and whatever we do?

We, who are conservationists, attempt to evaluate our problems and determine what measures to apply.

You, who are citizens, have the grave responsibility of determining policies through your votes—and through your action at community, State, and national levels.

You ladies from the Tupelo area know that Lee and Union County leaders recently voted to develop a number of dams in the Town Creek watershed for multiple-purposes—and they're discussing the possibility of attracting new industries into the area, and providing boating, fishing, hunting, and water skiing for these people who formerly had to go out of State for these sports.

These, then, are Mississippi's problems: Land that needs treatment; water that needs control and management for beneficial uses. What can you do—what can the public do—to be sure we're dealing wisely with our conservation problems?

You clubwomen, through your conservation programs—and many of you as landowners and operators—are conscious of good farming measures. Rotation of crops—stripercropping—terracing—contour farming—these are not foreign terms to you.

As one conservationist has phrased it: "The voice of the future is heard only feebly over the din of the market place—and the public has a responsibility to speak on behalf of future citizens."

The public—and that is you—can speak for State action in the matter of soil and water conservation. The public—and that is



A Mississippi conservation land-use scene of contour tillage, terraces, and improved pastures.

Note:—Excerpts from talk by the State conservationist, Soil Conservation Service, Jackson, Miss., before the Women's Cabinet of Public Affairs at Jackson.

you—can explore resource problems on the local and State level—conduct discussion forums—and, through publicity programs and other means, recognize the work of individuals and groups in conservation. The public—and that is

you—can ask that conservation courses be made a part of the education of every Mississippi teacher—and that every school child be taught these vital principles upon which his very future depends.

Because you are women—con-

cerned deeply with the preservation of life—you have a unique opportunity to improve the health and vitality of your families—and of future generations—through promotion of conservation on the land.

QUEENS OF CONSERVATION

By Erland A. Loving

HOW can pretty girls help in the promotion of soil and water conservation? One answer comes from the commissioners of the Clinton County (Iowa) Soil Conservation District, which for the past 3 years has had the largest number of "Queen of Conservation" entrants in the State.

The county contest is sponsored jointly with the local Cooperative Association, and the sponsors call on the women to help make the contest a success. For example, the district clerk, Mrs. A. E. McIlvain, is responsible for contest arrangements. Women do the contacting—first with mothers of contestants and then the contestants themselves.

All girls who enter are honored at a banquet, and each is presented a gift and corsage. The identity of the two county winners is revealed at the 4-H Club Show, in which all the contestants also take a part.

How does all this help promote conservation? Through the contest, which has now become a tradition in the county, the commissioners have been able to explain their District program to people they had not been able to reach in the past.

Each contestant must present a 1-minute talk on conservation or cooperatives. The best source for this information is found on the

contestant's farm and in the conservation practices her family has installed.

Then, too, the queens have many talents and interests that help them present their conservation message.

Many of them have helped their fathers with contouring, building terraces, planting trees, and developing wildlife areas. In fact, one contestant has operated her father's bulldozer in building waterways!



The queens (l. to r.): Linda Cain, Delmar; Pattie Whalen, Clinton (1961 "Miss Iowa"); and Dorothy Reed, DeWitt.

Note:—The author is work unit conservationist, Soil Conservation Service, DeWitt, Iowa.

If your address changes, please notify us of your complete new address, including zone or RFD number, and include old address with our code number as shown above.

Tomorrow's Women In Conservation



Linda and Administrator Williams with Girls Nation plaque.

Among tomorrow's potential women leaders in the Nation's soil and water conservation movement are several teenage girls who have served as "Administrator for a Day" of the Soil Conservation Service in the American Legion Auxiliary's annual "Girls Nation" program for stimulating the youngsters' understanding of governmental operations.

The 1962 one-day "replacement" for Administrator D. A. Williams was petite Linda Dianne Kurtz, Reno, Nev., high school senior. Linda sat briefly in the leather chair behind the administrator's big desk, met and conferred with more members of his staff than she could hope to remember, and rejoined the other Girls Nation delegates later in the day with an arm-

ful of bulletins and other soil and water conservation references.

"It was a pleasure to meet and talk with all the kind people in the various divisions of the Soil Conservation Service," Linda wrote Administrator Williams in a near-perfect hand attesting to her standing as an "A" honor roll student. "Their patience with their 'Director for a Day' was a rewarding climax to a wonderful week at Girls Nation."

"Since I have a daughter," the "real" SCS head wrote Linda, "I know the pride and joy your parents experience with the honors you receive. All of us here in the Soil Conservation Service are proud of you, too."

17th NACD Convention

Denver, Colo., will be host city to the 17th annual convention of the National Association of Soil and Water Conservation Districts February 3 to 7, 1963. A highlight of the meeting, expected to draw about 1,300 district supervisors, Ladies Auxiliary members, and others, will be Sunday's opening nondenominational inspirational session. Its theme will be "We turn our eyes to the future"—the same as that for the annual Soil Stewardship Week, sponsored by the NACD, to be observed nationally May 19 to 26.

FEBRUARY 1963

Soil Conservation



SOIL CONSERVATION SERVICE • U. S. DEPARTMENT OF AGRICULTURE



OUR SOIL ★ OUR STRENGTH

Soil Conservation 25 Years Ago

"Recently public attention has been called forcefully to the wastage of our soils through erosion. It may be surprising to some of us that so little thought was given to this problem in the past; yet it is not so surprising when we realize that this is relatively new country in which land, for the most part, has been both abundant and cheap. In the exploitation of soils and the subsequent endeavor to redeem them, we are merely repeating history. Perhaps we of this country are somewhat exceptional, however, in that we are beginning in time to save our soils and are invoking the forces of science to help us . . .

"... the challenge calls for the visualization of the more outstanding problems to be found in the field and the capacity to enlist the services of both State and Federal research agencies in a broad effort to discover and assemble a body of knowledge adequate to the control of erosion as it bears upon the conservation of soils and soil fertility."



COVER PICTURE—Winter snows will give way again to scenes like this near Millersville in Lancaster Co., Pa., which attest to the way soil and water conservation land use has spread across the United States.

—Photo by William R. Berkland

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Soil Conservation

ORVILLE L. FREEMAN
Secretary of Agriculture

DONALD A. WILLIAMS
Administrator, Soil Conservation Service

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FRANK B. HARPER, Editor

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The True Measure of Conservation Progress

By Donald A. Williams

CONSERVATION progress around the Nation may be measured in at least two ways. One is by conventional figures on the planning and application of soil and water conservation practices on farms and watersheds. The other is by looking behind such statistical accounting of accomplishments and noting their beneficial physical, economic, and social effects.

The latter is the true measure of conservation progress, though such results obviously could not be realized were it not for the calculable accomplishments behind them. Soil and water conservation as we have seen it spread during the last 30 years is not, and never has been, carried on for the sake of conservation itself alone. It has been, on an ever-broadening scale, to further the well-being of all the people—on the farm, in both rural and urban areas, in communities large and small—statewide, regionally, and nationally.

Thus conservation treatment not only protects the land from erosion and depletion, but it results in use of land better to serve the needs of its users, be that for agriculture, recreation, or other purposes. By the same token, water conservation measures as they are developed today not only are aimed at preventing floods and erosion and sedimentation, but also at assuring the availability of water for similar multiple uses by all the people.

The public interest includes both long-time conservation of our soil, water, plant, and wildlife resources

and continued economic growth. Examples mount daily as we move ahead in this new year of 1963 of how this conservation program contributes directly to improved efficiency in agriculture, which, in turn, contributes directly to the Nation's total economic growth.

On the basis of cooperative soil surveys, research information available to them, and experience, soil conservationists provide land users with practical information about the alternate uses of different kinds of soil. Their work, in cooperation with responsible State and local agencies, especially soil conservation districts and watershed organizations, has helped materially in increasing efficiency and flexibility on farms. Such flexibility has permitted production to be changed from that of farm products having a low elasticity of

demand to those with a high elasticity, as from wheat or potatoes to beef or fruit.

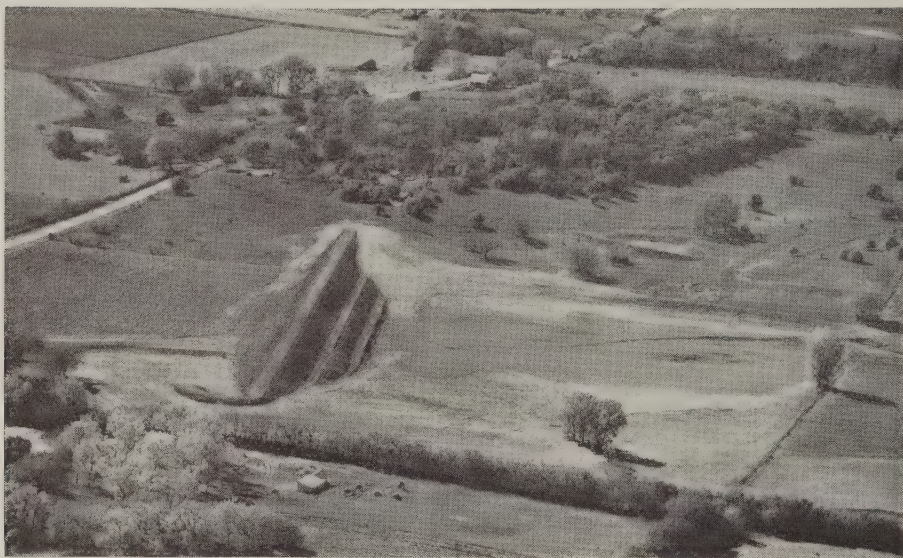
Such shifts in land use, in other words, have tended to reduce crops in oversupply, even in cases where other factors may have operated to maintain or to increase them. About two-thirds of the land shifted out of crop uses through the Great Plains Conservation Program, to illustrate, previously had been in feed grain, principally, and wheat and cotton. Although it is not the specific purpose of this program to reduce surplus crops, but rather to help bring about greater agricultural stability through accelerated soil and water conservation designed to cope with hazardous climatic and soil conditions, the effect of this shift has been a net reduction in total production of these crops.

Similarly in the South, shifts



By the late 1930's soil and water conservation measures already were beginning to protect the land like this near Garnaville, Iowa, on an extensive scale and to help build more prosperous communities.

Note:—The author is administrator, Soil Conservation Service, Washington, D.C.



In the fifties, watershed protection and flood prevention projects began taking conservation beyond individual farm boundaries. This dam, finished in 1960, is in Jefferson County, Kans.

from row crops to pasture or to managed woodland, especially for pulpwood, continue to be made, as do this same kind of conservation conversions all over the country, with comparable effects. Anywhere, these conservation adjustments in land use also show that we do not need to grow crops on soils that give low returns for what is put into them but that, by fitting our uses of the land to the soils and other factors determining its capability, we can avoid both waste and scarcity in production when and in amounts needed.

Other conservation adjustments, which are receiving increased emphasis, likewise have shown that we do not need to have housing, industrial, and other nonagricultural developments encroach upon our best agricultural land. Soil and water conservation planning has been drawn upon successfully more and more in the location and preservation of recreational and wildlife areas so important in the competition for land space and water acreage that grows keener every year.

The breadth and depth of our conservation undertakings are reflected in these major efforts which are being accelerated all along the line, and in which the Soil Conser-

vation Service cooperates by providing technical or cost-sharing assistance: Soil conservation district programs; small-watershed protection and flood prevention projects; the Great Plains Conservation Program; the Rural Areas Development program; and farm recreational and other undertakings on non-Federal lands. These and other broadened soil and water undertakings authorized in the Agricul-

tural Act of 1962, affecting farm and nonfarm interests as well, indicate how today's land- and water-use adjustments indeed are designed to serve the needs of all the people.

The adjustments taking place today through operation of these and other programs, like the Agricultural Conservation Program, are essential to the Number 1 policy objective emphasized in the Department of Agriculture's Land and Water Policy Committee report of May 1962, "Land and Water Resources—A Policy Guide." It is: "Resource uses that will yield continuing maximum benefits," including that of promoting desirable other uses for lands not needed for agricultural production.

Changing our uses of presently cultivated land, for an indefinite time or permanently as conditions and needs may dictate, is receiving more attention and positive action today on the part of those concerned with agricultural and related land use than it ever has before. The authorizations contained in the 1962 Agricultural Act for developing long-range land-use adjustment programs at national,



By the sixties, not only rural areas but urban areas and cities were reaping conservation benefits—here in stream channel protection on Mad River along Main Street of Winsted, Conn., in the Litchfield SCD.



Today, recreational facilities have been added to the dividends paid by watershed and other conservation developments like this lake in Madison County, Tennessee's Johnson Creek watershed.

State, and county levels, provide the most recent example. It is particularly significant that the Act opens the way to agreements for taking land out of cultivation based on conservation plans developed by farmers and ranchers. The provision for land-use adjustments on a long-term scheduled basis is similar to that which has worked so successfully in the Great Plains Conservation Program started in 1957.

The fact remains that we have in this country more cropland—good, productive cropland and that which is in cultivation that should not be—than we now need; and such an accelerated positive program for putting this overacreage into productive grass, trees, wildlife, recreational, or other beneficial uses is a move in the right direction. The findings of the Land and Water Policy Committee that some 50 million fewer cropland acres will be required to meet our needs by 1980 is confirmed by those of the National Inventory of Soil and Water Conservation Needs completed in 1961 by the Department in cooperation with Federal, State, and local agencies and organizations in 3,000 counties.

We are fortunate as we face these broader adjusted uses of the Nation's land and water resources that we now have had nearly a third of a century of experience in developing and perfecting conservation technologies and mechanisms for putting them to extensive use for individual and public benefit. This principally through the programs of 2,935 farmer-organized and farmer-managed soil conservation districts, embracing 93 percent of the country's farmland and 96½ percent of its farms, and in small-watershed projects serving multiple community or other area purposes.

Out of approximately 1,825 applications received from local organizations since this program's start in 1954 for Federal technical and cost-sharing assistance on watershed projects, 816 have been approved for planning. Of these, 450 have been authorized for operations, with 78 of them completed. Watershed projects are proving to be increasingly valuable as a means to furthering rural area and recreational developments, in addition to, or as a part of, their flood prevention, watershed protection, and multiple water-development

purposes. In at least one-third of the projects which have been approved for operations, the structural measures have purposes other than watershed protection or flood prevention.

The progress the people of the United States have made toward safeguarding their indispensable soil and water resources between 1933 and 1963 adds up in the data-processing machines to a record of which all the Nation may be proud. Even more gratifying is the fact that from land or air the mural of conservation may be seen as it spreads across the land. But the painting is far from being finished, as the conservation needs inventory so unmistakably confirms. With the growing number of new conservation "tools" which are or will be available, however, we reasonably may expect in another 30 years to see the major remaining panels filled in, and this land of ours made secure for the support and enjoyment of the generations to come.

Have You Seen?---

- "Classifying Rangeland for Conservation Planning," by F. G. Renner (retired) and B. W. Allred, Soil Conservation Service, USDA Agriculture Handbook 235. The main items included in the bulletin are discussions of range sites, standard soil surveys, and range condition; examples of range sites and range-condition classes; and the use of information on range sites and range condition in conservation planning.

- "Soil Surveys," by the Soil Conservation Service, USDA Picture Story 146. There are at least 70,000 different kinds of soil in the United States. A soil survey explores the limitations of land for specific uses. The SCS now maps about 50 million acres each year, and has surveyed more than 821 million acres, or more than a third of the Nation's land. This folder tells of the many uses made of the soil survey.

Conservation Ground-water Control Rescues County Road—Farmland

By Robert J. Packer

A GROUP of Treasure County farmers in Montana found that they could solve their problem of a high and rising water table in productive irrigated land by working together through their soil conservation district.

Some of their land wasn't productive any more, because it was waterlogged and so salty that it no longer produced good grass. The situation was so bad, in fact, that a 1½ mile section of county road became so wet it was abandoned. Cropland which had produced good crops of sugar beets, corn, hay, and irrigated pasture was becoming less productive. The ground-water table was rising slowly, bringing a little more alkali to the surface each year.

Six of the farmers from the seeped area asked for help in March 1955 from the Treasure County Soil Conservation District. The district supervisors asked the Soil Conservation Service to see what might be done. In November, the SCS, at the district's request,

drilled and cased some 70 test wells in the area.

The distance from the water in the test wells to the surface of the ground was measured and recorded each month for the next year. Service engineers then made a survey of the area and established the ground elevations at each test well. By plotting the ground-water contours on a map, it was possible to fix the direction of ground-water movement. This information, combined with the test-well logs, provided the basis for a remedial drainage improvement plan.

By the time the plan was ready in the fall of 1958, another group of farmers, who farmed the Hysham Bench just above the seeped area, had become interested. They felt that if they could use the proposed drain as an outlet for their waste water, they could afford to contribute toward the cost of construction. The Hysham-West drainage group now involved 19 operators and about 5,700 acres.

The members agreed on an equi-

table share of the cost to be borne by each individual, and drew up a trust agreement. A pooling agreement assured the group that about half the cost would be paid for with Agricultural Conservation Program funds. A contractor agreed to wait for the ACP payment to the group before collecting full payment for his work.

The drainage plan called for crossing a large irrigation canal, a natural drainageway, two county roads, the railroad, and a highway. Officials of all of these facilities had to be dealt with; and powerlines, telephone lines, and fences had to be crossed.

Work began in the spring of 1959, four years after the original six farmers had asked for help. The results were gratifying from the start. Ground water poured into the new ditch. At one point, the dragline operator was forced to shut down for a day to let water drain away. The first 6,500 feet of construction went according to plan.

The ditch was planned to follow the county road for about 4,500 feet. Conservation-minded county commissioners agreed to let the operator pile the soil on the road. It later was spread out to raise the roadbed about 2½ feet.

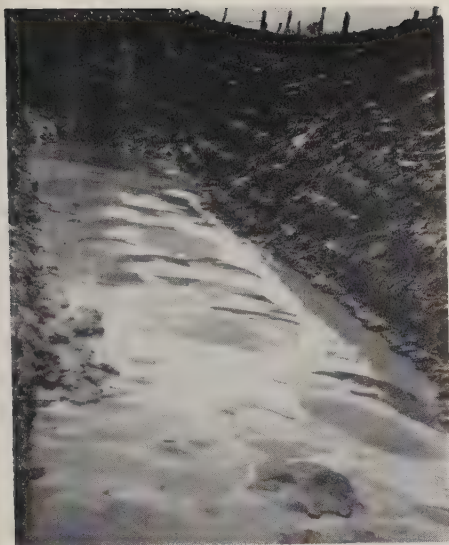
Finally, after waterlogging and other obstacles were overcome, one portion of the drain was completed. Another part was started, and late in 1959 the end of construction appeared in sight. About 1,000 feet of excavation and the highway crossing remained.

As the ditch neared the highway,



Stabilized portion of Hysham-West Drain. Note salt accumulations on ditch banks.

Note:—The author is work unit conservationist, Soil Conservation Service, Hysham, Mont.



Part of ditch along railroad tracks west of Hysham, showing mud boils from artesian pressures.

so much water was encountered that it was impossible at that time to go on, and the contractor shut down for the rest of the winter in

hopes that by spring some of the artesian pressure would lessen. Work did resume in the spring and, although the ditchbanks still were not fully stable, it was possible to install the highway crossing. Conditions were better beyond the highway, and the excavation was completed early in 1960.

More than 160,000 cubic yards of earth was moved, and about 1,200 feet of metal pipe was installed, at a total cost that far of \$62,490. The railroad crossing alone cost \$8,383. The great amount of water encountered, coupled with areas of unstable soil, caused the cost of construction to rise sharply. The ACP cost-share payment of \$28,654 was made available. Completion of the job called for leveling of the spoil banks, with the ditch to be cleaned and brought down to grade as soon as the banks were stable.

Benefits were apparent immediately, and more are showing up. Spots which would "bog a saddle blanket" have dried so they can be crossed with a pickup. An abandoned county road again is open. Fields are being farmed on which it was impossible to use machinery.

One farmer had a well which had become unusable because the high water table had increased the concentration of salts. After the drain was dug, the water table dropped, and the water was usable again. The local elevator had been plagued with water in the grain pit. This problem was helped by the drain. There will be other benefits which can't be measured, including decreased maintenance costs on the railroad and highway roadbeds.

As one member of the group said: "The drain not only benefits us farmers; it is helping the whole community."

Birdsfoot Trefoil

Conservation Discovery

By Homer E. Stennett, Paul G. Mattern, Jr., and Guy C. Fuller

THIRTY years ago we were looking for a high producing forage legume that would grow almost anywhere. Birdsfoot trefoil, which now grows almost everywhere in rural New York, and in other parts of the country, turned out to be the answer.

Its blossoms make a yellow blanket along New York's country roads and superhighways. In the villages it can be seen along the curbs, on vacant lots, and even in lawns. On the farms, it ranks with alfalfa as one of our two most valuable legumes.

Note:—The authors are area conservationist, Soil Conservation Service, Wellsville, N.Y.; associate agricultural agent, Extension Service, Ellicottville, N.Y.; and former agronomist, Soil Conservation Service, Macomb, Ill.



Birdsfoot trefoil with grass yields high-quality forage for many years with reasonably good management.

Birdsfoot will stand a wide variety of conditions. It will grow on poorly drained or droughty soil. William Howe, Cattaraugus County, N.Y., agricultural agent, says "It is giving alfalfa (equivalent) production to many farms which could not normally maintain long-lived forage."

Paul Almeter in Allegany County has a 12-acre field of birdsfoot trefoil on a poorly drained soil drained by a diversion ditch system. In 1962, a drought year, the field was mowed the middle of June and yielded 112 tons of grass silage. It was pastured afterward, and Almeter estimate the field would produce 3½ to 4 tons of hay equivalent.

The trefoil is long lived Roy Lane in Cattaraugus County planted a 2-acre field on a trial basis in 1939. He has harvested hay and pastured the field every year since. It still is producing so well that he has no intention of plowing it.

Karl Chamberlain of Cattaraugus County made a 1-acre pasture planting in 1939. From that acre, the trefoil has spread all over the farm. A sign by the side of the road proudly proclaims the name Chamberlain gave the farm—"Birdsfoot Acres."

Birdsfoot trefoil beautifies the countryside. Fields growing trefoil are green shortly after the snow goes. It progresses from a green to a yellow green as blossoms begin to show.

In many places where trefoil was used to seed diked ponds 10 to 12 years ago, the unmowed and ungrazed trefoil has grown higher and denser, providing excellent food and cover for wildlife. Trefoil also has other benefits. It improves the tilth of the soil, causes greater insoak of water, and reduces runoff.

Trefoil first was discovered in the United States growing in the Hudson Valley in the 1930's, by Frederick Eisenhard of the Soil Conservation Service. Professor Johnstone-Wallace of Cornell identified it. Somehow, not intention-



Seed pod from which birdsfoot trefoil gets its name.

ally, it had been brought from Europe where it was known even in ancient times.

The plant spread rapidly in the Northeast and in parts of the Corn Belt and the Pacific Northwest. County Extension agents hurried its spread, through an educational program, as did Soil Conservation Service men through their fieldwork with farmers. Soil conservation district supervisors bought seed and resold it to district co-operators, to seed down construction areas of disturbed soil.

It was in these ways that birdsfoot trefoil was introduced onto thousands of farms, until today, in New York State first, and then in almost all of the Northeastern States, growing birdsfoot trefoil has become one of the leading practices for conserving soil and water.

Twenty-one northwestern Illinois counties provide another example of how birdsfoot trefoil has been moving into a prominent place as a pasture legume. Reports from the soil conservation districts in this Illinois area show that more than 6,000 acres of pasture with trefoil as the only legume in the mixture has been established in the last half-dozen years. Farmers and SCS technicians report that the principal reasons for interest in this forage crop are long life for a pasture legume, elimination of the bloat problem, and the high feed value and palatability of tre-

foil for all kinds of livestock.

Interest of a few farmers became apparent around 1950, when soil conservation district cooperators began trying out trefoil in comparison to other legumes. Much has been learned since about how to establish good stands. Knowledge of its soil requirements, management needs, and general environmental conditions was needed, because trefoil was a new plant in this area. Farmers, SCS technicians, farm advisers, and seed dealers have ferreted out the steps necessary in its establishment.

When correct seeding techniques are used, failures to obtain stands of trefoil have been no more frequent than with any other legume. Also, birdsfoot trefoil can fill a gap in a conservation program on steep and irregular topography, because of its long life and high feeding qualities. Research data show that trefoil-brome grass pasture will yield returns in pounds of beef comparable with those from alfalfa-brome grass.

At the Albia, Iowa, Experimental Farm, for example, trefoil was a slow starter; but, by the third year, trefoil-and-brome grass was producing as much beef to the acre as alfalfa-and-brome grass. With a reasonably good management program, the trefoil pasture was expected to be productive for many years.

The acreage increase in Illinois has resulted from a need for good pastures on farms where either beef or dairy cattle are an important part of the operation, and where the topography, soils, and climate are all favorable for the establishment and long life of trefoil pastures. When trefoil is established on land best suited for pasture, it provides effective erosion control, and brings greater financial returns.

Fifty years ago, it took 100 minutes of farm labor to grow a bushel of corn;—today, with mechanized farming, only 10 minutes.

SIGNS OF CONSERVATION PROGRESS

By V. P. McConnell

THOUSANDS of soil conservation district and individual district cooperator identification signs along the country's roadsides graphically point up soil and water conservation progress in the decade and a half since the first known sign was put up in the West Side Soil Conservation District in Idaho in 1948.

That sign, on the west side of Idaho Falls, had to come down after a dozen years or so of service, to make way for a new interstate highway. The supervisors had the old sign—one of four erected in 1948—varnished to preserve it, with a view to having it kept in the National Association of Soil and

Note:—The author is work unit conservationist, Soil Conservation Service, Idaho Falls, Idaho.

Water Conservation Districts' archives at League City, Tex.

The Association, through which the districts and their cooperators for a number of years have been able to order manufactured metal signs, reports that about 50,000 signs now dot the countryside. Some four thousand of these are roadside signs marking district boundaries, and 45,000 or so are smaller signs proclaiming that farmers or ranchers are district cooperators.

The granddaddy of them all was planned by the original board members of the West Side district: Chairman Emil C. Johnson, Thure Anderson, Lowell C. Moore, Norbert Brinkmann, and Walter Pancheri. They also obtained finan-

cial help from local business houses for building it and the other three signs to let people know they were traveling in the by then 4-year-old district.

"You Are Now Entering the West Side Soil Conservation District," the first sign read. It also conveyed information on the total area in the district, the number of acres under irrigation at the time, and the names of those who provided the sign.

"We received lots of recognition for our district from those who saw the signs and from publicity at the time we installed them," Johnson recalls. "Folks commented favorably about them at conventions of State and national associations of soil conservation districts."

Five new baked enamel signs reading, "Entering the West Side Soil Conservation District," now stand at main entrances to the district. Each of the present supervisors assumed responsibility for the erection of one sign, in frames made of 1½-inch pipe and set in concrete. Today's supervisors are Brinkmann, chairman; John Gellings, Lowell Moore, Hollis Beaker, and Hugo Hockwart.



Nation's first SCD sign gives way to new metal sign. (L. to r.): Chairman Norbert J. Brinkmann of West Side district board of supervisors; Emil C. Johnson, first district chairman; and author.

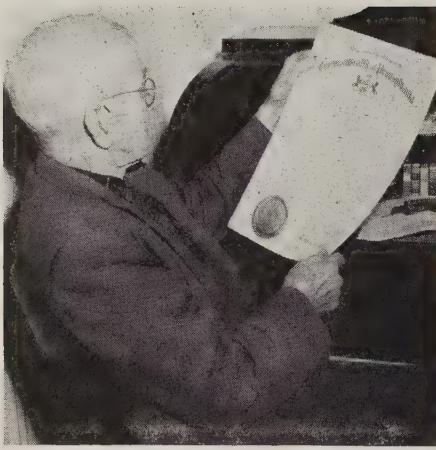
A newspaper item explaining the much greater cost of one airport's construction over that of another airport in the same area concluded:

"One reason was that the search for good soil on which to put runways paid off. Its runways required only 16 inches of concrete; (the other) has patches of soil which pack so poorly that 36 inches of concrete had to be laid."

Conservation Progress

Stirs Pennsylvanians' Memories

By Charles Slaton



Pennsylvania's first SCD director, John Smith, reviews charter granted Black Lick district in 1938.



Early demonstrations, with much of the work done by hand, paved way for modern conservation program.

THE hills of Pennsylvania's Indiana County hold fond memories for many of today's soil conservation farmers. It was here in the 1930's that scores of new recruits joined in the early erosion control demonstrations in the Crooked Creek Watershed Project. They proved that land and people can co-exist, and became the cadre for a new crusade which has changed the landscape.

In those trial-and-error days, men like John Smith were true pioneers. Living on the outside edge of the demonstration area, Smith watched the new experiments in controlling erosion on his neighbors' farms. And he liked what he saw.

Dairyman Smith became the first

soil conservation district director in Pennsylvania upon organization of the Black Lick Soil Conservation District, including parts of both Indiana and Cambria counties, later expanded to separate county-wide Indiana County and Cambria County districts.

"Back in 1938 we were able to get 10 townships together," Smith, now an octogenarian, recalls. "Most of the land was hilly, the soil was washed, and the yield was poor. The farmers were in pretty bad shape. Back then we didn't have the proved ways for using our land properly. Those of us who tried the new ideas of the Soil Conservation Service technicians were considered odd. And it took a great deal of coaxing to get some of our neighbors to accept their help."

From this meager beginning Smith has watched the soil conservation districts expand to today's

60 districts that take in about 92 percent of all the farmland in the Commonwealth. Today, patterns of soil and water conservation can be seen almost everywhere, and conservation has become a way of living in many parts of the State.

Another conservation pioneer who aided in getting Pennsylvania's first district started is John Stephens. Talking conservation, attending meetings, and encouraging farmers took up a great deal of his time back in 1937. During the district referendum, he hauled voters to the polls in his pickup truck. At 26 he became a member of the first board of directors.

Stephens believes that soil conservation is a major reason the family farm has been able to survive.

"Conservation makes the difference," he says, "between making a living and just hanging on. The



Patterns of land-protecting and water-conserving measures like this 1949 contour stripcropping near Danville today may be seen from one end of the Keystone State to the other.

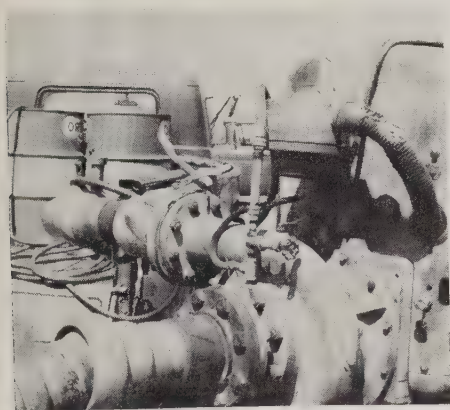
Note:—The author is assistant to the State conservationist, Soil Conservation Service, Harrisburg, Pa.

fellows who went along with the program got a lot of benefits. For the most part they are the more prosperous farmers today.

"Today it's a source of pleasure to see conservation on the land wherever I go in Pennsylvania. Back in the late thirties, this wasn't

so. Our big job then was to get farmers to plant trees, use more lime and fertilizer, fence out the woodlots, strip-crop their fields, and improve their pastures. The early district served as a catalyst in helping to get these practices more generally accepted."

John Smith and John Stephens have been part of a conservation crusade which has changed the landscape of Pennsylvania. They have witnessed 25 years of progress in soil and water conservation, but they will tell you that the big job is still ahead.



Hose connected to irrigation pump and inserted in fertilizer drum.

AN effective and economical method of applying liquid nitrogen to hasten the growth of vegetation on small-watershed dams was developed and used by Soil Conservation Service employees in the Trinity River watershed in Texas during the summer of 1962.

Newly built floodwater-retarding structures in areas where the soils are erodible must have a cover of grass established quickly to prevent damage by water erosion. Irrigation during dry periods, application of nitrogen, and such other conservation treatments as weed control and regulated grazing made it possible in some cases to establish a good turf in the one growing season.

W. G. Ely, SCS technician at Denton, developed the method. Where the dams and spillways are to be irrigated, the application of liquid nitrogen in the irrigation water saves the expense of applying the pelletized form of fertilizer prior to the irrigation. This saving has amounted to approximately \$5 an acre for each topdressing.

Note:—The author is agronomist, Soil Conservation Service, Denton, Tex.

New Way To Fertilize Grass on New Dams

By William L. Smith

Adaptation of the sprinkler irrigation system to apply the liquid nitrogen was simple and inexpensive. The vacuum line to the irrigation water pump was disconnected and the fitting removed. This fitting was replaced by a pipe nipple, and a tee was installed on the nipple. This arrangement permitted the vacuum line to be reinstalled, along with a valve and hose adapter. Once the hose was connected, the other end was

placed in the barrel containing the liquid nitrogen fertilizer.

The objective was to apply the 55-gallon drum of fertilizer in about 30 minutes, to insure uniform distribution. By making measurements of the fertilizer depth with a gage stick at 5-minute intervals, Ely was able to check the amount used, and to regulate the rate of application by adjusting the valve accordingly.



Distributing liquid nitrogen on bermudagrass on floodwater-retarding dam through sprinkler irrigation system.

Hawaii's Land Operators Ba

By Rob



Soil saving—field of pineapples planted on the contour in the West Kauai SWCD.

CONSERVATION of soil and water resources is big business in Hawaii today.

In the 1962 fiscal year alone, for example, farmers, ranchers, and other land operators in the 50th State dug down into their pockets and spent some \$2,600,000 for developing conservation programs on their lands. This money was in addition to such assistance as the technical services of the Soil Conservation Service through Hawaii's 16 soil and water conservation districts and cost-sharing provided by the Agricultural Conservation Program.

What are they getting for their money? Year by year district records give the answer. They show, among other accomplishments, that these land operators in the 1962 fiscal year extended contour farming to approximately 16,500 more acres; put cover and green manure crops on 850 acres of truck crop-

lands; utilized crop residues on more than 23,500 acres; and established cropping systems that protect the soil against erosion and conserve water on 16,000 more

acres.

Other means of controlling and managing their resources developed during the year included more than 240,000 linear feet of field diversions built, 13,500 feet of irrigation canals and laterals installed, and more than 7,000 feet lined to prevent water losses. These canals and laterals, along with one new irrigation reservoir, supply water to irrigated fields, of which nearly 14,400 acres had water management applied in accordance with the needs of the crop and the soil.

Soils in parts of Hawaii are subject to wind erosion. To protect them to assure crops, operators planted 14 acres of tree wind-breaks and made 92 acres of critical-area plantings on their croplands. Brush and scrub trees were cleared from 5,000 acres to make



Water saving—concrete irrigation ditch skirts sugarcane field in West Oahu SWCD.

Note:—The author is State conservationist, Soil Conservation Service, Honolulu, Hawaii.

Conservation With Dollars

Brown

way for improved pastures, which were seeded on nearly 4,500 acres of this land and on grassland on which only poor species were present. Nearly 40,000 acres of poor pasture also was renovated to improve the grass stand.

Rotation grazing was practiced on more than 5,100 acres, and 182,500 acres of pasture and range was used in such a way that stands will be improved. Because proper use of range requires water development, the soil conservation districts' operators used 54,700 feet of pipeline to supply 130 troughs or tanks with water that made possible better distribution of livestock and better grass management.

Land that had been an erosion hazard was made useful by more than 800 acres of forest tree planting with species that before long will become a useful timber crop.



Water for thirsty cattle—stockponds on the Parker Ranch in the Mauna Kea SWCD.

Improvements during the year to provide good habitat for big game and upland game birds included developing five wildlife watering facilities in the more arid areas.

To help land operators with the planning and application of their conservation program, soil scientists of the Soil Conservation Service mapped more than a third of a million acres of privately operated land, bringing the total mapped to date to 1,887,755 acres, or 46 percent of the total land area of the State.

During the year, 155 land operators with 202,000 acres in their holdings became cooperators with the State's locally managed soil and water conservation districts.

The work land operators have done in applying a conservation program on their lands will have lasting benefits to the soil, water, and plant resources of the State. It is estimated that, in financial benefits alone, for each dollar spent the returns will be multiplied from 2 to 20 times.

Thus it is that conservation is assuring an improved land for present and future generations in Hawaii.



Grassed waterway carries water safely off of this field in the West Oahu SWCD.



Plowed ricefield being flooded before leveling.



Field being leveled in the water.



Field remains under water after leveling.



Young rice growing in leveled field.

Riceland Smoothing—*Under Water*

By Chester F. Bellard

UNDER-water smoothing of land with conventional dry-land smoothing equipment is a growing conservation practice being used by farmers in the rice-producing area of Louisiana.

They have found that the benefits of land smoothing far outweigh the cost. Other advantages include: Better drainage, making earlier planting possible; more

even distribution of water, thus requiring less water to produce a rice crop; better weed control; and uniform ripening of the crop for increased quality and yields.

Technical help on this and other conservation practices by technicians of the Soil Conservation Service is provided to farmers cooperating with soil conservation districts in keeping with basic conservation plans.

The Rice Experiment Station personnel at Crowley conceived

the idea of leveling fields in water. A levee is built around the entire field, which is plowed and then flooded until the lower half is completely covered with water. This permits the operator, using a regular farm tractor and hydraulically controlled leveling blade, to see high areas, which are cut down and brought into the water. After all such protruding areas have been eliminated, the water remains on the smoothed field until all the silt has settled out.

Note:—The author is work unit conservationist, Soil Conservation Service, Alexandria, La.

A field can be smoothed in water for less than half the cost of doing the same job on dry soil. Another advantage of this method of level-

ing is that the work can be done anytime, even during rainy seasons.

Judging by the number of farm-

ers who have used this method with good success, indications are that this will become the accepted method of land smoothing in this area.



The Dean Of Tennessee Districts

AS the sun rose on April 19, 1870, over the Cumberland Mountains of the Eastern Highland Rim in Tennessee another American patriot made his entrance on the stage of life. He was Beecher C. Huddleston, who later was to be known as the "Dean of Soil and Water Conservation Districts" in Tennessee.

Born of pioneer stock, Judge Huddleston, who was Putnam County judge from 1926 to 1942, bought his first piece of land in 1899. The 40-acre tract, originally owned by his grandfather, was part of a land grant for services rendered during the Revolutionary War. The land had been abandoned for many years, because of erosion and low productivity, and the price of \$5 an acre almost exhausted Huddleston's life savings.

The future looked dark for the young farmer and his 4-year-old orphaned son, but the land had to be made to produce a living. First, he turned to conserving the soil. There was no large earthmoving equipment available in those days; so Huddleston cut brush to plug gullies, made rock dams, plowed in gullies with a team of mules, and began the long, hard struggle with limited resources and "know how" toward reclaiming his rundown farm.

When Putnam County farmers organized a soil conservation district in 1940, the long, tireless task of reclaiming his original forty,

with little knowledge as to land use and treatment, was fresh in Judge Huddleston's memory. He was among the first to develop a basic soil and water conservation plan on his farm, which had grown to 180 acres, and he helped lead his neighbors in the local conservation movement.

He was elected as a district supervisor and secretary and treasurer in 1944, and held these positions until his retirement in December 1961.

In August 1946, the Judge and other supervisors of the State met at Peabody College in Nashville and organized the Tennessee Association of Soil Conservation Districts, of which he was elected vice-

president for middle Tennessee.

When the Tennessee Watershed District Act was enacted in 1954, Judge Huddleston also was instrumental in organizing the Dry Valley and Roaring River Watershed districts in Putnam County.

During 18 years, he missed only one local district board meeting, because of illness, and did not miss a single area or State meeting. At the 1961 State meeting the 92-year-old dean of soil and water conservation in Tennessee gave this challenge to the delegates: "For our Nation to remain strong, this organization must continue to be always on the move toward a more vigorous district program."

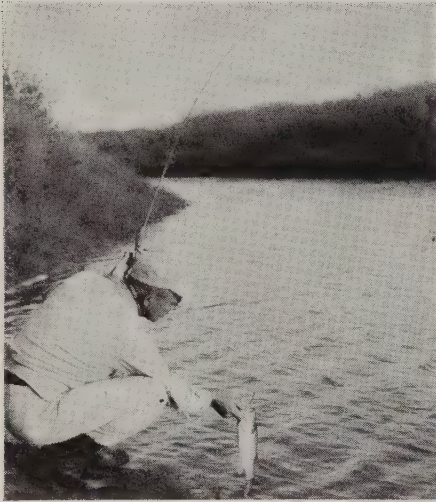
—LEONARD W. DAVIS



Judge Huddleston welcoming supervisors and watershed directors to 1962 meeting of Tenn. Assn. of Soil and Water Conservation Districts.

Community Watershed Project Brings Many Benefits

By Ruth C. Metz



George Davis with largemouth bass caught in water behind Ray Coatney dam.

WATERSHEDS come in all sizes. Compared to the "average," Frog Hollow in north central Kansas is in the thumbnail class. It is a fine example, though, of the way farmers are solving tough problems through their own combined efforts with a measure of Federal technical and financial help.

There are 4,300 acres in Frog Hollow—nearly seven sections—in Ottawa County. Frog Hollow is in the lower reaches of Salt Creek watershed—a big one involving 300,000 acres. Salt Creek has organized a watershed district under Kansas law and has requested assistance under Public Law 566. Frog Hollow is a model for the people in the large watershed. They can see firsthand how their flooding, silting, and erosion problems

can be solved.

The problems of the people in the area in the mid-fifties were common to that part of Kansas—heavy rainfall causing damaging runoff, washing out crops, fences, roads and bridges, and eating away cropland. The entire flood plain had been damaged by silting almost every year.

The late Ray Coatney was the farmer who first decided something should be done. He lived where two creeks come together. His upland was eroding, and his lowland was being damaged by silting. Fence repair was an annual expense.

After talking with his neighbors and learning that his problems were theirs, too, Coatney got in

touch with the Soil Conservation Service, the County Agricultural Stabilization and Conservation Committee, the county Extension agent, the County Commissioners, and the Ottawa County Soil Conservation District supervisors, who offered their cooperation in finding a solution.

SCS technicians working with the district chose tentative sites for six floodwater-retarding dams, but first helped farmers develop conservation plans for necessary land treatment on 24 of the 30 farms in the area. Owners got ACP cost-share help on terraces, waterway shaping, and grass seeding.

The years 1954, 1955, and 1956 saw much conservation work ac-



Frog Hollow watershed with J. E. VanMeter detention dam in foreground, Willard Sechrist dam at extreme upper right, and Ward White terraces, shelterbelt, and farmstead.

Note:—The author is area clerk, Soil Conservation Service, Manhattan, Kans.

complished. Silting was being reduced. The farmers had built enough terraces and waterways, and seeded enough of the cropland to grass for construction of the dams to start, under ACP pooling agreements with all the benefiting farmers contributing. Five of the dams were completed in 1956, and the relocated sixth dam in 1959.

Since the dams were built, Frog Hollow farmers have speeded up their land treatment. They built more than 1.5 miles of flowways. They planted shelterbelts, wildlife habitats, and grass. About 85 percent of the conservation practices needed to protect the land have been installed.

Farmers, county officials, and the community all are pleased with results of the Frog Hollow community watershed project. Gerald Sechrist, for example, says he hasn't had to touch a fence that

used to wash out several times a year. And the late Lee Baccus said at first he didn't believe his rain gage, after the work was done. Formerly, a 2-inch rain would flood his fields; now there's a controlled flow down the valley instead of a "gully-washer." Baccus lost 30 to 40 acres of wheat almost every year before the dams were built. A son, Vince, who now operates the farm, says they received the cost back in 1 year from the crops saved.

County Commissioners reported that the expense of keeping up roads and bridges in the area already has been reduced. On the black-top road between Minneapolis and Ada, a small bridge could not span the heavier flows; but since the dams were built and the flow rate reduced, the bridge is adequate. There's practically no road-bed damage now.

The six dams are providing pro-

tection for 436 acres of flood plain and also furnish abundant livestock water. They cost \$12,525, of which ACP cost-shared \$8,170. Some of the farmers believe the total area for fishing and boating—37.4 surface acres at primary spillway level—is in itself well worth the price paid. This is a bonus, of course; because the prime benefit of the project is protection of their investment in their land.

The community is enjoying recreation advantages, as the lakes behind the dams are stocked with fish. For instance, when George Davis took his children to the Coatney Dam on one fishing trip, three other families already were there, and more arrived until the bank was lined with fishermen. These dams attract local people as well as some "regulars" from Minneapolis, Delphos, and Ada. Fishing is good—and mighty popular!

Conservation Pays Off For Oregon Rancher

By Everett C. Green

ALTHOUGH he "grew up" on the Fort Rock Valley ranch he now operates Merritt "Bud" Parks has learned new things about the soil that are paying off handsomely—thanks to a Soil Conservation Service soil survey. A member of the Board of Supervisors of the Fort Rock-Silver Lake Soil Conservation District and member of the Oregon State Soil Conservation Committee, he learned how his land could be treated for most efficient production and maximum conservation.

With the program well under way and new things learned about soil-plant relationships, Parks said he is "using improved soil and water management practices to increase yields of alfalfa and inter-



Parks (l.) and neighbor Bill White look over intermediate wheatgrass planting.

mediate wheatgrass hay from 2½ to 4 tons an acre." He also has used smooth brome with alfalfa.

Water management long has been important on the Parks ranch, be-

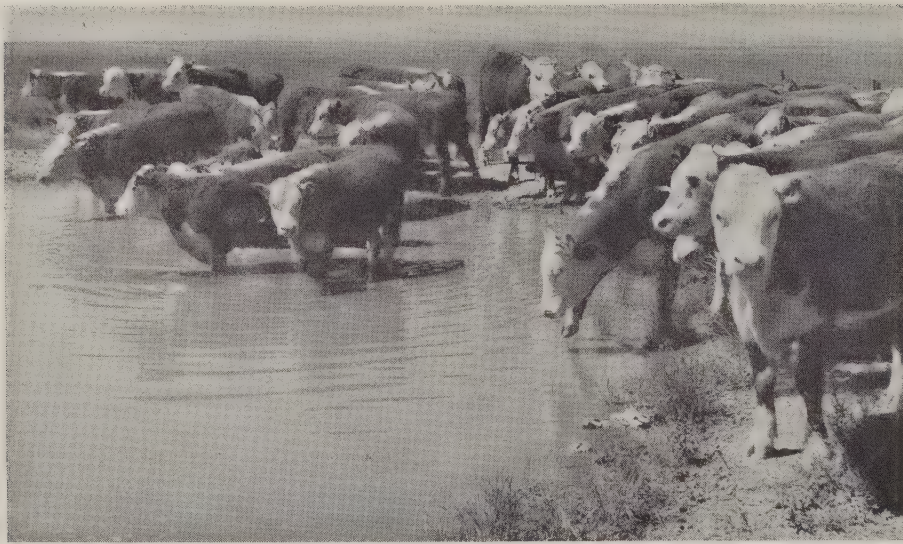
cause of droughty soils and low rainfall. Without the conservation of water, little forage would be harvested for feeding cattle and horses during winter.

Bud said he and his father thought of using level border irrigation on fairly flat land as far back as 1932, but it was not until after the soil conservation district was formed on March 19, 1953, that they were able really to try it out—even then on a small scale.

The acreage of level border irrigation is increasing year-by-year on areas that are almost level before any work is done on them. Several people have asked Parks why he used level borders instead of the sloping kind often used by others. Here's the payoff he cites:

The time it takes to prepare the soil for planting and irrigation is

Note.—The author is soil conservationist, Soil Conservation Service, Silver Lake, Oreg.



Stockwater at many locations is key to Parks ranch grazing utilization.

cut almost in half. He can do the job with the equipment on the ranch. The amount of water required to produce a crop is almost one-half. It is easy to start crops. Labor to irrigate is less, and it takes less attention by the irrigator.

With level borders, two irrigations a season are all that are needed to grow 4 tons of alfalfa-grass hay. The sloping kind would require four irrigations.

"Forage production for livestock is important on a ranch of this kind," Bud said. "I have been improving my range by planting grasses that are adapted to the soils and climate. Crested wheatgrass

has done a good job for me. It has been used a great deal by the Bureau of Land Management for the re-establishment of forage plants on land that has been allotted to me for my own use."

Most soils in the Fort Rock Valley are sandy and subject to severe wind erosion if allowed to remain barren. To eliminate the wind-erosion hazard while preparing rangeland for seeding to grass, Parks removes the sagebrush in approximately 200-foot strips. He seeds rye for a year or so, until the brush has been killed by cultivation, after which the brush is planted to adapted grass. Then

when the grass strips have become established, the strips of brush between the grass strips are removed and seeded.

Giant wildrye grass is being grown from seed that Bud collected from native plants. He also has grown some Idaho giant wildrye grass from seed furnished by the SCS, for winter pasture with a protein supplement.

Hauling water to livestock on the range is done on the Parks ranch with good success. As a result, no area becomes abused, because the cattle usually are well distributed over the range in a way that large numbers do not collect in small areas. The increase



Alfalfa-grass hay like this Parks is stacking is part of his conservation payoff.



Cattle on rye pasture planted in strips prior to seeding grass.

in extra pounds of beef has more than paid for the expense of hauling water into isolated areas.

Parks believes not only in soil, water, and plant conservation, but in wildlife conservation. He has built farm ponds to provide water for antelope, birds, and deer. Small grain for wildlife food and cover is made available in small, isolated areas surrounding cultivated fields. This Fort Rock rancher has been cooperating with the Oregon State Game Commission in its safety program by putting up signs that say: "Hunting by Permission." He also has provided habitat for Chukar partridge recently introduced into the area.

"Sod-busting" the Conservation Way

By J. H. Senterfitt and H. E. Van Arsdall

"SOD-BUSTING" reminiscent of yesterday's West is being used in Florida today but with an important difference. Here the land is periodically returned to grass in a sod-based conservation rotation instead of being kept continuously in cultivation and subject to soil erosion like that which led to dust-storms in the Great Plains.

Bill Beasley is one of those who has taken advantage of this practice to restore and maintain production on his farm. He considers bahiagrass "the best thing that ever happened to Florida." To most people this means good cattle grazing; to Beasley it means cattle grazing plus wind erosion control, better soil, and bigger crop yields.

Beasley began to rotate bahiagrass pasture with cultivated crops as the principal feature of his soil and water conservation plan worked out with Soil Conservation Service technical help through the Levy Soil Conservation District. He plowed out his first 40-acre field of bahiagrass in the fall of 1956. Watermelons, planted in the spring of 1957, were his first crop. With the usual fertilization, he produced 900 melons to the acre—about twice his usual production.

Alyce clover for hay followed the melons, followed in turn by a blue lupine cover crop plowed under for corn in the spring of 1958. After corn harvest that fall, the field was reseeded to Pensacola bahiagrass.

Thus a 2-year cultivation period between periods in which the land was used for pasture started the sod-based rotation system. Most of the Beasley farm now has 3 years of sod between cultivated crops;

but his goal is 4 years in sod to 1 year in cultivation.

"I am looking forward to when I expect to have 800 acres in bahiagrass and 200 acres in cultivation," he said. "To do this I will have to reduce my corn acreage. With the sod rotations, the use of cover crops, and good fertilization, I believe I can produce all the corn I need on less land."

In talking about some of his experiences with sod rotations, Beasley told about his 1958 peanut crop:

"I planted a 12-acre field following a bahiagrass sod," he recalled. "I intended to harvest this crop as part of my peanut market allotment. During the season, however, another field planted on old cropland looked better, and I changed my mind. The peanuts dug from the cropland field produced only 1,200 pounds an acre. I ran 70 head of hogs for 90 days on the 12 acres of peanuts on the sod land, and I am sure I would have harvested at least a ton of peanuts an acre had I dug them."

By the next year, his peanuts following a bahiagrass sod yielded 1,600 pounds of nuts an acre, despite wet weather, a late harvest, and loss of many of the peanuts.

With all the benefits of grass in maintaining soil productivity, its normal use remains that of providing feed for cattle. The income from cattle and the sale of grass seed harvested each year now are important items in the overall farm picture in this area.

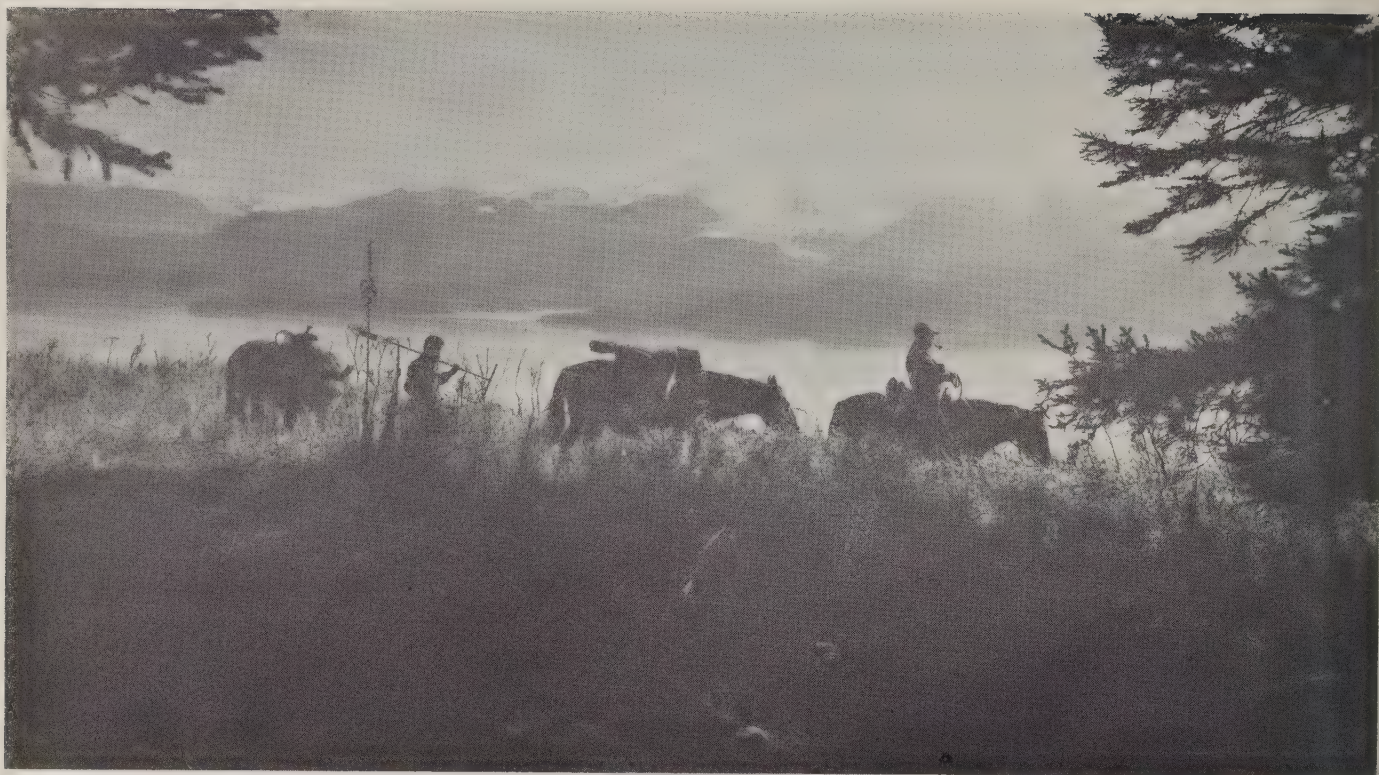
Although Beasley is a strong believer in Pensacola bahiagrass, he realizes there is a place for other grasses on most farms in his district. He has 137 acres of pangolagrass. This grass furnishes summer grazing, just as the bahiagrass does; but its chief use is for winter grazing, as it stands up better than bahiagrass and furnishes grazing for a longer period.

Supervisors of the Levy district in 1959 selected Bill Beasley for the Florida Bankers Association Award as "Outstanding Conservation Farmer" in the district.



Bill Beasley in watermelon field in May holds piece of 8-year-old sod turned in January.

Note:—The authors are work unit conservationist, West Palm Beach, and agronomist, Lake City, both of the Soil Conservation Service, Florida.



Alaska—land of vast distances and beauty—invited and challenged these soil surveyors as they took to the field for early surveys in the Fritz Creek area near Homer.

Alaska— Last Conservation Frontier

By William B. Oliver

ALASKA is the United States' last frontier for soil and water conservation development as it is for farming generally.

Conservation, more recently undertaken in the 49th State than in the older parts of the Nation, so far is measured here less in acres, feet or miles, or numbers of individual soil-saving and water-management practices that have been planned or applied than in terms of progress in finding ways of dealing with unfamiliar land-use problems. One such problem peculiar to Alaska, for example, is that

of "permafrost"—a frozen layer of saturated soil just beneath the surface soil, which melts unevenly when the land is cleared, causing level land to become hummocky and highly erodible.

In seeking practicable preventive conservation techniques to use in dealing with such problems, soil surveys—dating back to the first reconnaissance surveys made at the turn of the 1940's—are uncommonly important in determining the course of the State's future conservation program and measures used.

Many factors affect this new State's agricultural development.

In Alaska, the soil conservation district program accordingly takes a somewhat different approach than in older, more developed areas of the United States. Its cooperators start in most instances with virgin soils.

Alaska is a land of vast distances and marked climatic differences, and its agricultural areas rank among the smaller of the States. Three-fourths of Alaska is in the north temperate zone, the remainder being north of the Arctic Circle. Precipitation varies from as much as 150 inches annually in the southeast to an average of only 12 inches in the Tanana Valley. The

Note:—The author is State conservationist, Soil Conservation Service, Palmer, Alaska.

growing season ranges from an average of 160 days along the southeastern coast to from only 90 to 80 days in the central Tanana and upper Yukon Valleys. The southern coastal sections seldom experience zero weather in winter; whereas, in the interior, the temperature may drop to as low as 70° below zero for short periods in the winter, and rise to more than 90° above zero during the summer.

Southeastern Alaska has only a few scattered areas of coastal plain that are suited for agriculture. At higher latitudes—in the area just south of the Alaska range—lies the most promising agricultural area, and it has about two-thirds of the State's population. This area embraces three large river valleys—the Copper, Matanuska, and Susitna—and the Kenai Peninsula.

North of the Alaska Range, the Tanana Valley is another area of considerable agricultural potential. It is one of the first areas in interior Alaska that had agricultural development—gardens and small farms developed during the gold rush days of 1898 to 1902 to produce vegetables for miners and forage for livestock. In addition, Kodiak and a number of islands in the Aleutian chain have extensive native grasslands which, with careful land use, it is believed some day will support a profitable livestock industry.

Commercial agriculture in Alaska started in the Tanana Valley on a small scale in the early 1900's, and in the Matanuska Valley in the 1930's. Today, most agricultural activities are confined to the Matanuska and Tanana Valleys and the Kenai Peninsula, with approximately 20,000 acres harvested. Crops include hay and pasture for livestock, oats and barley, and row crops such as potatoes, lettuce, cabbage, and carrots.

With the coming of commercial agriculture, manmade erosion soon became a problem. When the protective vegetative cover is removed for farming, the land becomes sub-

ject to both wind and water erosion. Soil surveys are needed to guide the safe use of this land, and to evaluate particularly the agricultural potential of different areas.

Despite a lack of development capital, competition from surpluses in the older 48 States, and lack of marketing facilities, Alaskan farmers are optimistic. Homesteaders are clearing land and making plans for its future use. Federal and State agricultural agencies are helping them. Supervisors of the 10 soil conservation subdistricts have recognized the need for land development in long-range plans of operations—stressing the need for farm development plans based on land capabilities and conservation treatment. Thus they are promoting land-clearing practices which will remove only native vegetation and moss, leaving valuable topsoil in place.

Soil Conservation Service technicians assigned to the Alaska Soil Conservation District have completed more than a decade of soil survey work in the State. More than 2 million acres have been surveyed. Approximately 42 percent of the land surveyed is suitable for

tilled agriculture.

Soil surveys are used both as a basis for guiding settlement and for planning development of individual farms. They also are used as basic data for tax assessments, by the University of Alaska in selecting endowment land, and by the Alaska Department of Lands in classifying lands for sale and management purposes.

Much of the unprotected land in the Matanuska Valley is subject to severe damage from north (Matanuska) winds in the winter, and from east (Knik) winds in the spring when soils are being prepared for planting. The most effective way of preventing wind erosion damage on row-crop land has been found to be a combination of crop rotations, windbreaks, and stripcropping.

Water erosion is a constant threat on the light and unstable soils in Alaska. Serious damage has been experienced frequently in the Tanana Valley, where sloping fields subjected to runoff from snowmelt and summer showers erode severely when unprotected. In areas where agriculture is just becoming established, erosion control measures are being developed



Improved pastures for livestock feed and land protection, like this one at the Alaska Experiment Station at Fairbanks, are important in the State's conservation program.



Fairbanks SCD supervisor Russ Wood planting potatoes on the contour. He planned to have all of his future cropping operations likewise on the contour.

along with other general farming practices.

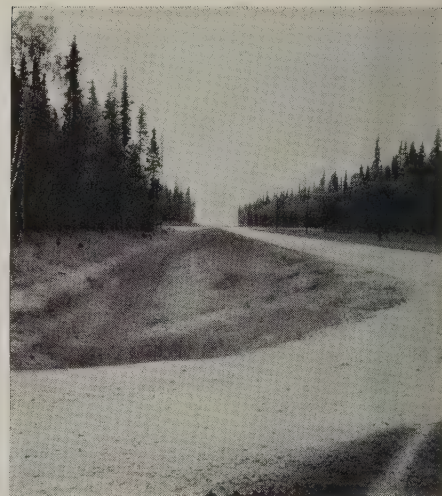
Streambank protection is needed along some Alaska rivers. Structures such as log or rock jetties and riprapping, along with tree plantings, are used to prevent bank cut-

ting. Meanwhile, draining of waterlogged areas and installation of sprinkler irrigation systems also are helping land development and soil and water conservation programs in Alaska.

The conservation program in this still unfolding agricultural area provides a unique opportunity to develop the State's agriculture on the basis of sound land use—to gear this program to land capability by classifying soil resources and fitting them into a proper pattern of cropping, grazing, woodland production, and industrial and recreational uses.

In this connection, district supervisors are active in the Rural Areas Development program for Alaska. They realize that Alaska needs to develop timber, water, and mineral resources as fully and rapidly as possible to provide additional markets for agricultural products.

In Alaska, the emphasis is upon "preventive" conservation rather



Grass seeded conservation drainage ditch on road to Wildwood Station north of Kenai.

than upon repairing damage already done. In other words, it is a case of "doing" the right things with the land and not so much of "undoing" the wrongs like those that were done in other States—before soil and water conservation came along.

Conservation Needs Inventory Guide To County Planning

By Fred W. Herbert

AUTHORITATIVE basic information for use in gaging future development of a number of California counties is being drawn from findings of the recently completed National Inventory of Soil and Water Conservation Needs. This study was made by the U. S. Department of Agriculture under leadership of the Soil Conservation Service in cooperation with Federal, State, and local agencies and

Note:—The author is retired assistant State conservationist, Soil Conservation Service, Berkeley, Calif.

private interests.

Findings of the inventory as pertaining to southern California, for example, were included in a publication, "Southern California Agriculture—A Look Ahead to 1970 and 1980," compiled and distributed by the Agricultural and Natural Resources Departments of the Los Angeles Chamber of Commerce. Chairman W. E. Tesche of the projections subcommittee of the agricultural committee stated that "the inventory confirmed the fact that the necessary land resources

would be available in connection with our projection of continued expansion in crops and livestock in the southern California counties."

Paul N. Williams, economist of the California State Chamber of Commerce, stated that his organization is using the inventory in studies of the economy of various regions, made at the request of cities, counties, local chambers of commerce, and others.

"Counties particularly want to know just what they have in the way of resources so that they will

know in what direction development can go," he said. "The needs inventory, along with the land-classification information, is very valuable to us in these studies."

El Dorado County was among the first in the Nation to publish an inventory report, in August 1959. The county planners feel that El Dorado County fast is becoming a scattered residential area, bringing up difficult and complex problems relating to schools, utilities, and taxes. They quickly realized that the inventory would provide the basic information necessary for planning to help solve these problems. Accordingly, the committee was re-activated, enlarged, and renamed "The El Dorado County Resources Utilization Committee." It has published a 94-page report entitled, "The Long Term Outlook for the El Dorado County Livestock Industry," and other studies are under way.

In Kern County, the conservation needs inventory report stated that "it gives an overall picture of the land situation at present, it provides a basis on which to measure expected land use, it can be used in program planning and developing short and long period goals, to determine where to place emphasis on conservation education and in general to guide all who are interested in conserving these basic natural resources."

Kern County's report points out further that the inventory information may be very significant to the county's people and economics in the next 15 years in view of expected increases in population and farm production capacities. Although, according to the 1959 census, Kern County ranks second among the Nation's top agricultural counties in terms of value if products sold, it still has thousands of acres of undeveloped land. The way in which this land will be utilized is of tremendous importance. Intelligent planning, based on reliable information, will make possible the most beneficial use of

the county's soil and water resources.

In Santa Clara County, the inventory committee pointed out that the Santa Clara Valley has been "one of the unique places on the face of the earth because of its mild climate, long growing season, rich, deep alluvial soil, abundance of water, and nearby markets." All these factors worked together to create a combination of circumstances ideal for intensive production of pears, apricots, prunes, cherries, strawberries, vegetables, and other speciality crops.

For almost 100 years, city-farm relations in Santa Clara County remained in proper balance. Crop yields became steadily larger, and finally most of the Class I and Class II soils were farmed intensively. Since World War II, however, urbanization has become one of the major problems. In a single decade, population increased from 280,000 to 600,000, and cropland decreased from 247,000 to 187,000 acres. The statement is made in the county inventory that, "if

nothing is done to check the shift from agriculture to industry, we may see cropland completely disappear from the valley floor."

In Stanislaus County, the inventory report was published by the County Planning Commission. The inventory committee went on record with the statement that: "The value of a group study and analysis was amply demonstrated. It was apparent that the data would be of value to local as well as national planning." The committee indicated that the report will stimulate public thinking that will result in planning to accommodate the increasing population with the least possible injury to the agricultural economy of the county.

In San Bernardino County, where flood protection is of vital importance, a considerable portion of the county's published inventory is devoted to watershed project needs. Ninety-one watershed areas were delineated, and 7 projects totaling nearly $\frac{3}{4}$ million acres were listed. These already have been considered as meeting the



City of Santa Rosa protected by Central Sonoma Watershed Project.

If your address changes, please notify us of your complete new address, including zone or RFD number, and include old address with our code number as shown above.

criteria for assistance under the Watershed Protection and Flood Prevention Act.

Publication of the county report was financed by five soil conservation districts. The report is made available as a public service to agencies and individuals concerned with proper land use.

The inventory data also have been used by the California State office of the Soil Conservation Service in describing the extent of various land uses and soils within resource areas for technical guides; and by the Western States office of the Economic Resource Service in its report on "Long Term Production Prospects for Western Agriculture."

The inventory classification of land as irrigated, dry farmed cropland, and pasture and woodland grazed, has been used by the Agricultural Stabilization and Conservation State Committee as "indicated needs" guides in allocating ACP funds to counties.



Alaska, our largest State, had only 367 farms in 1960, the Bureau of the Census reported. About half of these were part-time farms, with the operators working 100 or more days off the farm. Sales of farm products totaled \$3.2 million in 1959—less than 7 percent of the income from fishing, Alaska's largest private source of income.

First District Cooperator Honored By Family and NACD

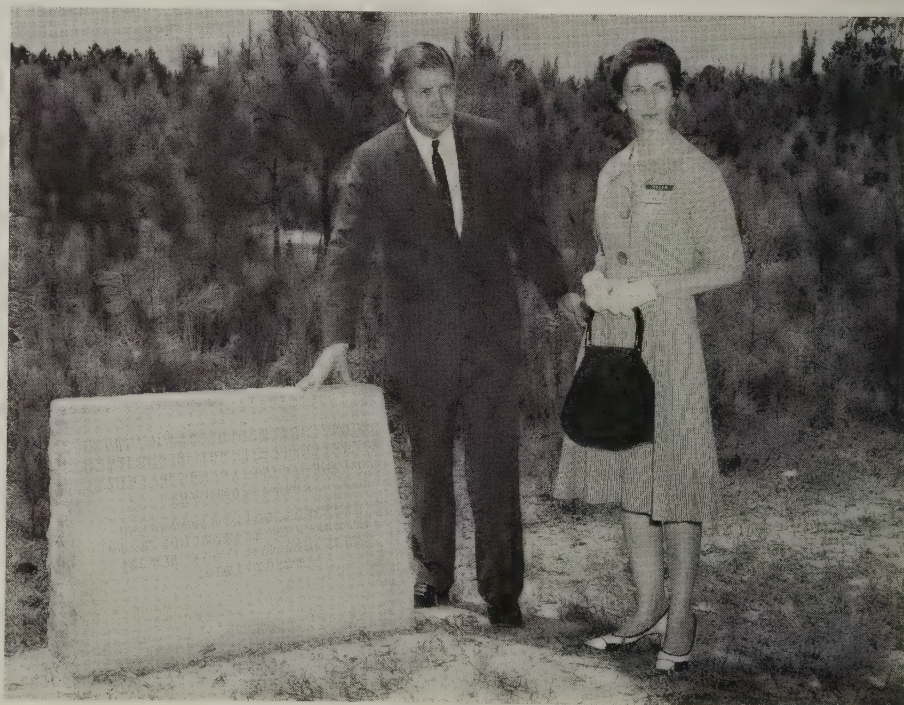
Mrs. F. Y. Sorrell stands with Gov. Terry Sanford of North Carolina during 1962 dedication ceremonies of a granite marker to her late husband as the Nation's—and the world's—first soil conservation district cooperator on their farm south of Ansonville.

The deed to the plot on which the monument stands was presented to President Marion S. Monk of the National Association of Soil and Water Conservation Districts by Rep. A. Paul Kitchen of Wadesboro on behalf of the family of Dr. Sorrell. Monk also accepted for the Nation's more than 2,900 soil conservation districts a copy of the district contract for the Sorrell farm and a copy of the Brown Creek district charter. The marker's inscription reads:

On This Farm Was Developed the First Conservation
Farm Plan in the Brown Creek Soil Conservation
District; the First Soil Conservation District
Chartered in America.

This Site Deeded to the National Association of
Soil and Water Conservation Districts on August 7,
1962, by the family of Dr. F. Y. Sorrell, the First
District Cooperator

(See SOIL CONSERVATION, "Historical Marker," page 72, October 1962.)

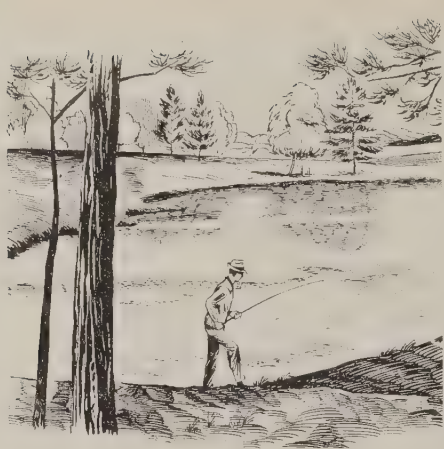


MARCH 1963

Soil Conservation



SOIL CONSERVATION SERVICE • U. S. DEPARTMENT OF AGRICULTURE



Soil Conservation 25 Years Ago

"During the past few years the attitude of those who use the land in America has undergone a remarkable change. Only a few years ago most of our farmers thought of soil erosion, if they thought of it at all, as an inevitable process of nature which caused them only inconvenience and irritation. They are now beginning to recognize that process as a very real peril to their own welfare, as well as that of the Nation, and to cope with it in a practical and effective manner.

"This change has been brought about, in part at least, by a national program of soil conservation. . .

"The task ahead is one that will require active soil conservation effort on the part of all those who live on the land and use it for agricultural purposes. And recent events seem to indicate that American farmers are ready and willing to start on this undertaking."



COVER PICTURE—Bass and bluegills provide good fishing for these youngsters trying their luck in the Westminster Community Pond designed by SCS technicians and stocked by the Maryland Game and Fish Commission in Carroll County.—Photo by Gordon S. Smith.

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Soil Conservation

ORVILLE L. FREEMAN
Secretary of Agriculture

DONALD A. WILLIAMS
Administrator, Soil Conservation Service

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FRANK B. HARPER, Editor

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Recreation Brings New Opportunities To Rural America

By Lloyd E. Partain

RECREATION on purpose rather than just by accident today is an increasingly important end product of small-watershed projects and other rural area and community conservation developments. There is a major compelling reason.

Our fast-growing population, concentrating more and more in urban areas from one end of the country to the other, has brought an upsurge almost overnight in public need and demand for outdoor space—both land and water—where people can make healthful use of their leisure time. Their tastes run from fishing or hunting to golf and other sports, to hiking and bird watching, to plain old-fashioned picnicking or other family outings.

Greatly stepped-up soil, water, woodland, and wildlife conservation during the last 25 years or so, through local efforts on farms and watersheds bolstered by State and Federal financial and technical help, pointed the way for natural and human resource interests to meet this, one of the Nation's most challenging opportunities of our day, in stride. And with the major part of the country's readily accessible or potential hunting and fishing and other recreational opportunities found on non-Federal agricultural lands, it was logical for appropriate agricultural interests, from landowners to agencies experienced in this field, to be called upon to share the responsibilities of the reconstituted national recreational program.

Thus many recreational enter-

prises developed by farmers, ranchers, and woodland owners in recent years had been with the technical help of the Soil Conservation Service and the Forest Service, both in the U.S. Department of Agriculture. Even though there obviously were many new facets in the broadened recreational program recommended to Congress by the President early in 1962, it was but natural that already established techniques relating to outdoor recreation, such as fish and wildlife, biology, forestry, and soil, water, and range conservation, should have primary and expanded functions in the program's planning and supervision.

Historically, the Soil Conservation Service and the Forest Service have used those approaches in their coordinated resource conservation and development endeavors.

The new program simply expedites through more positive action in the public interest the multiple use and multipurpose principles that have been soundly developed in recent years. They now can be—and are being—put into full force and effect on private lands.

Major impetus to recreational and other natural resource conservation and development was provided in a series of directives issued in November 1962 by Secretary of Agriculture Orville L. Freeman "mobilizing the full resources of the Department of Agriculture in the most far-reaching attempt since the thirties to create new economic opportunity, update wasteful and outmoded patterns of land use, and infuse new vitality into rural America."

"The whole of America will benefit," he said of the projected



Recreation spots like this one in South Carolina are family favorites.

Note:—The author is assistant to the Administrator on recreation, Soil Conservation Service, Washington, D.C.



This North Carolina farm recreation operator knows how to advertise.

broadened program based on the application of various new authorizations by Congress in the Food and Agriculture Act of 1962, as well as upon a redirection of prior policies and programs of the Department to help meet present and foreseeable needs of all the people of the Nation. Included are:

(1) Major land-use adjustments to shift surplus crop production acres to grass, trees, wildlife, and income-producing recreation purposes.

(2) Broadened opportunity for local organizations to develop recreational facilities and municipal and industrial water supply as functions of multipurpose projects undertaken pursuant to the 1954 Watershed Protection and Flood Prevention Act.

(3) Expanded economic opportunities to individual landowners and operators, rural communities, and related business and industry.

The Department of Agriculture's role in the application of these principles includes technical assistance in land-use planning, soil and water conservation, forestry, wildlife and recreation development; cost-sharing and long-term credit; and public information leadership. But, the Secretary emphasized:

"In every case, I have made local initiative and leadership the first criterion for Department help

under the new programs. The Federal Government can provide incentive and technical services, but government cannot and should not do the conservation and development job for local people on privately owned land."

In this connection, the new directives opened the way to broadened opportunities and responsibilities for soil and water conservation districts as one of the major structures of local leadership and initiative in America. Technical assistance in land-use adjustments, soil and water conservation planning, and needed supervision of the application of practices is to be carried out in cooperation with the districts in accordance with a complete conservation plan for the entire farm, ranch, or other unit of privately owned land.

The Secretary's directives also assigned specific functions to agencies of the Department concerned, including assignment to the Soil Conservation Service of leadership and responsibility in "Income-Producing Recreation Enterprises on Rural Non-Federal Lands." It is the Department's policy to:

Use all available authorizations

to encourage and assist rural landowners and operators and local organizations to develop hunting, fishing, and other recreational facilities as income-producing enterprises as part of a conservation plan for the entire land unit.

Enlist the cooperation of public and private agencies and organizations that can help landowners and operators in developing such undertakings.

Implement income-producing recreation developments through Farmers Home Administration loans to family-farm operators for establishing recreational developments to supplement farm income, and to groups of farmers and rural residents for recreation facilities related to shifts in land use.

Provide through appropriate agencies research, education, technical assistance, cost-sharing, and credit services needed in developing income-producing recreation on rural lands, including strengthened Rural Areas Development committees and technical action panels.

The 1962 Agricultural Act and the Secretary's policies for implementing them have established at



Water skiing is just one of the recreational uses made of lakes like this one in Georgia.

least three other milestones: (1) Recreational use of rural private lands is recognized as an agricultural use; (2) the objective in shifting land from row crops and small grains includes encouragement of the new uses for improving the income of individual landowners and operators and rural communities; and (3) resource conservation and development programs and projects are to make available, in addition to food and fiber, other products and services needed by rural and urban people alike. The demand for outdoor recreation looms large in this framework.

New information, experience, and training for all concerned is needed to assure the program's success. In short, even a well-designed farm plan, the carrying out of which would result in adequate physical treatment of land and water resources and adequate recreational facilities, will not necessarily of itself assure success for the landowner or operator in his new undertaking. He will need to know, for example, a great deal about the market for recreation services, and how to

compete in that market and make a profit.

He may need financial and business management advice peculiar to this new aspect of his business. He will be dealing with people with varying likes and dislikes. In certain types of income-producing recreation, he and his family will have to perform jobs new to them; and employment of people with special skills may even be necessary, including architectural help on the design and specifications for buildings and other recreational installations. Health and safety regulations must be observed, and liability insurance has to be taken into consideration.

Additional cost-return information, economic and management research results, market studies, training of planning personnel and informing landowners and operators, exchange of experience, and practical promotion techniques all are needed to assure success of recreational undertakings on our farms and ranches. But the ever-growing need points to full justification of the effort. As President John F. Kennedy said in his State of the Union message to Congress



These large-mouth bass from farm pond on H & H Ranch near DeSoto, Miss., averaged 3- $\frac{3}{4}$ pounds.

on January 14, in discussing "new measures that we cannot afford to postpone:"

"Finally, our already overcrowded national parks and recreational areas will have twice as many visitors 10 years from now. If we do not plan today for the future growth of these and other great natural assets—not only parks and forests but wildlife and wilderness preserves, and water projects of all kinds—our children and their children will be poorer in every sense of the word."

Good quality recreation facilities on farms and ranches have proved popular and of benefit to farm and city people alike—such as lakes formed behind flood-prevention and multiple-purpose watershed structures, farm ponds, and streams and reservoirs protected from silt pollution. There already are uncounted examples of successful income-producing recreational developments on farms and ranches, but they represent only a beginning.

There is adequate space in rural America, as confirmed by the national inventory of soil and water conservation needs, for substantial further development for recreation purposes. Included are acreages of cropland not needed in the immediately foreseeable future for commodity production. Out-



Each week in season hundreds visit well-equipped Sportsman's Lake near Holdenville, Okla., built by the State with SCS assistance.

door recreation often can be made a rewarding part of a multiple-use plan for a farm or ranch.

It has been amply demonstrated that well planned recreational use

of land and water can contribute to the conservation and protection of natural resources while, through efficient management, yielding income and satisfaction to families

occupying rural lands and contributing to the economic betterment of rural communities and the strength and welfare of the entire Nation.

Texas Watershed Project Yields Bonus in Fun-Landowners' Income

By David O. Davis

WHEN the people in Green Creek watershed in central Texas began their flood-prevention project they had no thought of a possible bonus in fun. But, with the achievement of their flood-prevention goal, they also gained 13 lakes with water for fishing, boating, hunting, camping, swimming, and picnicking.

This part of Texas can get mighty dry. So another dividend from the project is water for irrigation and for livestock. The worth of the recreation, irrigation, and livestock water, all incidental to the original project purposes—flood prevention—is estimated at more than \$15,000 a year alone.

Green Creek is one of 62 streams selected in 34 States authorized by Congress in 1953 for pilot demonstrations of a practical approach to complete watershed protection as a means of conserving soil and water resources. The Green Creek project plan included the construction of 13 flood-prevention dams to supplement land-treatment measures such as terracing, cover cropping, and range seeding, applied with technical help of Soil Conservation Service working with the Upper Leon Soil Conservation District.

What farmers and ranchers do in soil conservation districts and watersheds for soil and water con-

servation on their fields, pastures, range, and woodland all helps to slow down rainfall runoff and to help prevent floods. But, when unusually hard downpours come, these measures can't slow down all that water. That is where the flood-prevention dams do their part. These dams catch the extra water from the intense storms. Then the excess water drains from the dams, at a slow rate, so that the water has little chance to "pile up" somewhere and cause a flood.

Some water remains, however, in sediment pools behind the dams. These pools are designed to catch and hold back most of the sand and mud the floodwaters might bring in. This keeps the sediment from being deposited on bottom land fields or from filling stream

beds.

Such pools may be lakes a few acres in area, or even a hundred acres. These are the lakes that provide recreation, stockwater, and irrigation in the Green Creek watershed.

The lakes are stocked with bass, bream, and catfish. Some of the owners have provided picnic tables and fire grates. Boats are available for rent. Because recreation areas have to be mowed and kept clean, several landowners have planted grass and shade trees for the comfort of picnickers and campers. Others have improved native tree sites on the lakeshores.

Nearly 6,000 people use the recreational facilities on these lakes every year. The added income to the landowners is esti-



Flood-prevention lakes in Green Creek watershed provide fishing, boating, swimming, hunting, camping, and picnicking, in addition to supplying water for supplemental irrigation and for livestock.

Note:—The author is field information specialist, Soil Conservation Service, Milwaukee, Wis.

mated to be about \$4,000 annually.

In addition, the extra water collected in 11 of the lakes makes it possible to irrigate more than 400 acres. This adds up to much better pasture and hay land, plus better yields from cultivated crops.

Sprinkler systems are commonly used for this irrigation. The average cost of these systems is about \$5,000. Permits to use the water are obtained from the Texas Water Commission, at a cost of about \$150. This cost, though, is offset by the total annual net return, in the watershed, of more than \$10,000.

Farmers figure the additional livestock water is worth at least \$1,000 to each of them each year. And it is not just at the lake-shores where this benefit shows up. For, when other stockwater sources begin to dry up, landowners with flood-prevention structures on their place open valves and share with neighbors downstream.

The sponsors, the Upper Leon district and civic groups in the city of Dublin and in Erath County, marshaled their resources for getting easements in October 1953. By February 1954 they had completed all easements—61 documents with 143 signatures. And the easements were given free by the landowners. The sponsors agreed to maintain the grass and fences around the structures. The result of this and other cooperative action by the people was that all



Fishing from a watershed lake on the Richardson farm, 1 of 13 stock-watered with fish in Green Creek Watershed Project.

structures planned for the watershed were completed by 1957.

Green Creek, in an area often subject to dry spells, has a history of floods. There were 87 floods during the 20-year period prior to the beginning of the watershed project. Even before all construction was completed, high intensity rainstorms struck the watershed. In 1956, for instance, three completed structures flowed 18 million gallons a day for 22 days. Had this volume of water rushed out all at once, both land and towns would have been hit hard. To date, benefits from the reduction of flood damages are estimated at about \$361,000.

The people in Green Creek watershed are proud of their proj-



Picking up baled sudangrass hay that was irrigated from floodwater-retarding structure on W. K. Richardson farm.

ect. Leander Kiker, who has one of the lakes on his place, summed up the feelings of everyone when he said:

"The flood prevention is the most important. I've had water all over my best land too many times in the past to forget that. But—the extra water in the lakes is a nice thing to have, too. It is good to be able to irrigate when it hasn't rained for a long time—and to have water for your cattle. And it is good to have these places now where folks can go and have some fun and relax a bit."

Have You Seen? . . .

● "Rural Recreation, A New Family-Farm Business," released by the U. S. Department of Agriculture. The Secretary of Agriculture asked a task force of Department agency representatives to review the current status of recreational use of agricultural land and report on the possibilities of income-producing recreation enterprises on farms and ranches. This resulting report describes the kinds adapted to farms, with examples; cites factors affecting their development; suggests local organizations available to facilitate such farm recreation developments; and explains the role of the Department.



Irrigating a striperropped, contoured peanut field on Joe Paalmore farm with water from floodwater-retarding structure.

Doves and Peaches

Double Land Use

By Verne E. Davison

PEOPLE who may think "We can't spare any land for growing choice wildlife foods" could take a tip from the Caggino family of Gaffney in South Carolina's Cherokee Soil Conservation District.

The Cagginos made field-trial plantings of browntopmillet, a choice food of mourning doves, in several of their extensive peach orchards on their "Sunny Slope Farms" in 1961. These are sloping lands where erosion must be controlled by some kind of cover crop between the trees. Browntopmillet had not been used for this purpose, but it proved to be excellent.

A field trial like that suggested to the Cagginos by Soil Conservation Service technicians is simple: Plant what you have in mind; appraise its success in terms

of soil and water conservation; and, in the case of dove habitat, determine its value to the birds and the success of hunting. Also look carefully at the costs, and at any likely disadvantages.

Although this trial planting was successful in 1961, the browntopmillet reseeded itself in 1962 and was even more satisfactory than it was the first year. Dove hunting has been excellent, with 200 to 300 birds taken each hunting day. Hundreds of doves stayed in 1961 until the browntop was turned into the soil, and they were numerous throughout the following nesting season.

As to problems:—In 1961, more than 200 uninvited dove hunters surrounded the orchards, and drove up and down the vegetated waterways. An occasional enthusi-



SCS Work Unit Conservationist Sam Wolfe in 1962 growth of browntopmillet he suggested for dove food.

ast didn't know the rules for shooting over orchard trees, and the Cagginos had a few trees damaged.

By 1962, however, hunters were more considerate. They shot only from the farm roads and waterways, and left their vehicles off the waterways. Again the doves remained in spite of the hunting until the seed was turned into the soil.

A number of lessons were learned from these first two seasons' experience:

(1) Don't plant browntopmillet near public roads.

(2) Hold managed hunts only once a week, so peach pruners can work safely the rest of the week.

(3) Invite "paying guests." Use the income to defray the costs of managing the dove food—and the hunters—and thereby increase private and community profits from a new and enlarged agricultural crop.

(4) Leave some browntopmillet seed on top of the ground to feed the doves during the winter.

Such double land use should be both profitable and satisfying if these simple rules are followed.



Mourning doves thrive on browntopmillet cover crop in Sunny Slope Farms peach orchard.

Note:—The author is biologist, Soil Conservation Service, Athens, Ga.

Recreational Sites Near Home Key Phase of Conserving Soil—Water—Human Resources

By Susan Myrick

(Note:—Herself a cooperator with the Piedmont Soil Conservation District (Ga.), Miss Myrick for more than 15 years has told the story of districts and small-watershed programs; is author of a textbook, "Our Daily Bread," used in several States as a supplemental reader on soil and water conservation for elementary grades; received nationwide recognition for her promotion of the planting of blue lupine; and holds, among other honors for service to conservation and other agricultural endeavors, the 1963 Distinguished Service Award of the National Association of Soil and Water Conservation Districts. And Miss Myrick spent 7 months in 1939 in Hollywood as technical adviser on southern accent and manners during filming of "Gone With the Wind"!—Ed.)

WE'VE talked of conservation ever since Teddy Roosevelt's days; but millions of people still know nothing about it.

There are so many phases of conservation that it is difficult for the usual city man to know what the term means. Some think of conservation as cover crops to hold the soil; others think conservation is terraces; still others think it is grassing the road banks, reforestation, stopping forest fires, filling up gullies, building drainage ditches, building farm ponds, or big dams for irrigation; still others think of conservation only in terms of good fishing or hunting.

The woman, naturally, considers first her children, and her conservation thoughts turn toward making life a happy thing for the offspring. She thinks of good schools,

of proper diet, of character building, of the spiritual values of life, and she wants the best for her children.



Susan Myrick.

In many cases, rural women find it difficult to provide these things for their children. Conditions on the farm are vastly better than they were even 25 years ago. And when I grew up on that plantation in Baldwin County, Ga., things were really difficult for the country child. The 2-mile walk to school was probably good for my physical fitness, but the rainy days with the muddy roads were not exactly pleasant. The one-room school with its big pot-bellied stove and its outdoor privy was not much of a place for a child to get an education.

The home lighted by kerosene lamps, and heated by firewood in fireplaces in each room, the home with no bathroom and no indoor plumbing—well, the wife and mother of that day had difficulties today's mother knows little of.

Yet, those country children had a great blessing. I would not swap mine. The blessing of chores to keep me busy, the blessing of having a calf to love and take care of, the blessing of being close to growing things, of damming up a little branch and wading in the stream, of catching catfish in Big Cedar Creek, of knowing about birth and death and life on the farm.

Today's city women have the problem of "no-outdoors" for their city-reared children. Schools, yes—far superior to those I know in my youth; but they have problems of crowded streets, no place to know the great outdoors, the lack of wilderness, the shortage of space and grass and trees, and the lack of opportunity to know birds and butterflies and wild flowers. All these mean much to the woman of today who is concerned about a full life for her children.

These days, it seems, people are excited over BIG things—man in space, trip to the moon, a billion pounds of TNT equivalent in that new bomb, a huge dam impounding billions of gallons of water. Many people take little interest, for example, in the small-watershed conservation program; some are even inclined to think of it as only a political handout to the farmer to provide a fish pond for him and his children.

We who know of the great value of the small-watershed program from a recreational, as well as a flood prevention and erosion control standpoint, must work to teach the others to understand that conservation of human resources must include opportunity for recreation as well as for work.

It's big doings to hunt deer in the Rockies, perhaps; but it is far more important that we have a

Note:—The author is associate editor, *Macon Telegraph*, and farm editor, *Telegraph and News*, Macon, Ga.



Ponds on J. D. Paulk and J. W. Trunnell farms in Central Georgia SCD do water conservation job in Bleckley County—for recreation activities like fishing and water skiing, and for livestock.

place near at home where we can get to the outdoors, or shoot at a few coveys of quail or a dove in season. It is fine to be able to go to the Florida keys and catch sailfish or to Maine to catch tuna. But the important thing is a place near home where the family can picnic and maybe tie onto a catfish or a black bass or some red bellies or bluegill.

We need as a part of our conservation work, today, to provide for recreational facilities for the people. From the woman's viewpoint, or the man's for that matter, conservation of human resources is the most important phase of conservation.

Wildlife Conservation Farm

Developed for City Visitors

By Frederick Merrill

IT must have been the hundredth call in the 7 years Clerk Lois Anne Dickson of the Mahoning Soil and Water Conservation District in Ohio had received requesting this information: Where can Boy Scouts, Girl Scouts, Brownies, school groups, garden clubs, etc., go to see conservation in action?

This problem long had been plaguing the district board of supervisors, but this time Mrs. Dickson had an inspiration. She knew that no farmer wanted hordes of people trampling his fields; but she and her husband, Robert, had a farm they no longer were actively working. So why not use this farm to teach conservation? They accordingly decided

that this might be the best possible use for their land, and what was to become "Brae Rabbit Farm" became their goal.

The Dicksons also knew that if



Lois Anne Dickson examines ear from strip of dwarf corn planted for wildlife food and cover.

the city folks were going to fulfill their expectations of seeing a rabbit explode from a clump of grass, or hearing the cackle of a pheasant as he is flushed from a patch of sericea lespedeza, they would need help. Opportunely, the Ohio Division of Wildlife also had been looking for a place to provide conservation education on private land; and Game Management Agent Ken Allen promptly became interested in the Dicksons' proposal. Using the original conservation farm plan that had been developed with the help of Soil Conservation Service technicians as a guide, Allen helped develop a wildlife management plan for the farm.

One basic need for a farm wildlife community is variety. Small fields, with mixed vegetation patterns where several kinds of cover

Note:—The author is work unit conservationist, Soil Conservation Service, Canfield, Ohio.

meet, will support more rabbits, quail, and song birds than will large, open fields. Food supplies must be plentiful and close to cover that gives protection from their enemies. But, most important, food and cover must be available during the critical winter and early spring seasons when things are tough.

First came clearing of large trees from the fence rows, which accomplished two things: First, brush and briars now could grow to provide safe lanes of travel from one part of the farm to another and create undisturbed nesting cover. Second, the harvest from the fence rows provided material for brush piles that rabbits like so well. The Dicksons piled the larger logs on the ground, log cabin style. Then a generous supply of smaller branches was piled over the logs to form a roof. Nature helped, too, and grass and briars soon were adding to this protection from cold winter winds and predators.

One essential cover type was conspicuous by its absence—winter cover. Evergreens, in scattered small clumps, were planted to fill this need.

Next, long, narrow strips of



City biology class gets first-hand look at soil, water, and wildlife conservation on Dickson farm.

dwarf corn and sericea lespedeza were planted, with hairy vetch interseeded on each strip. This vetch will afford good cover the second year, and act as a ground cover and green manure when the food patch is plowed down.

When the first troop of Girl Scouts arrived, the chicken house had been made over into a theater, where they were shown "before and after" pictures of

"Brae Rabbit Farm." When they toured the farm, the wildlife performed exceptionally well. As they looked at the dwarf corn food patches, a hen pheasant and her brood scurried down the corn row. An old mother opossum sat on a walnut tree limb and impassively watched as the visitors rode by on a wagon pulled by the Dicksons' old tractor decked out in a new coat of paint. To climax the trip, a deer bounded from the thicket beside the spring.

Most of the people in northeastern Ohio, as in many other parts of the country, live in cities and accordingly are open to greater appreciation of natural resources. It is conservation minded landowners like the Dicksons who can provide the opportunity for better understanding of wildlife and other conservation problems and their solutions.



The University of Michigan Survey Research Center found that 9 out of 10 Americans participate in outdoor recreational activities. The most popular is driving for sightseeing and relaxation. Picnicking ranks next.



Loading branches from trees thinned from fence row for hauling to build brush piles for rabbits in open pasture.

Watershed Lakes Bring

By John Cros



Mayor Leon Sanders (r.) discusses plans for Plain Dealing's future with Dr. W. E. B. Lockridge.

"LAKE Plain Dealing" and "Lake Dogwood" are now important names to the folks at Plain Dealing in Louisiana's Bossier Parish. These floodwater structures, completed in 1961 in the Upper West Fork Cypress Bayou watershed, are pointed to with pride by Plain Dealing citizens.

"As many as 3,000 people in one day have used the lakes for swimming, boating, picnicking, and fishing," said Mayor Leon Sanders, who was one of the key figures in putting through the project. "They provide recreation for everyone from junior to grandma. Families who never used any recreation facility before now go to the lakes."

Cypress Bayou was one of the first watersheds in the United States to include fish and wildlife benefits in its original plan. The Louisiana Fish and Wildlife Service provided fingerlings to stock the lakes. A 5½ pound bass was caught in Lake Plain Dealing in November 1962!

Swings, slides, and a merry-go-round were built for the youngsters by J. T. Snyder and C. B. Gleason, partners in an automobile agency, at no cost to the town. Other local businesses around town built picnic tables and benches

at no cost; and the Plain Dealing town council appropriated funds and built a boat landing ramp, an enclosed swimming area, and a steel diving platform. A bathhouse with indoor sanitary facilities also is in the plan.

A concession stand dispenses cold drinks and sandwiches. The city of Plain Dealing built it, but leases it for 5 percent of the gross sales. Boat launching costs \$1, with the fees going into the recreation fund. No alcoholic beverages are allowed, and Concessionaire L. L. Norris is deputized by the sheriff so he can maintain order. Family-type recreation is encouraged.

The city of 1,300 people owns 60 acres of land around the lakes, part of which is under water and the rest of which is recreation area. Before the Cypress Bayou watershed was developed, youngsters had to travel 25 miles by bus for swimming. Now, the local athletic coach conducts swimming lessons

at the lakes, only 1½ miles from downtown.

The story of Cypress Bayou and Plain Dealing isn't all about swimming and fishing. People can well remember, for example, when after a flood they had to go to the post office in a boat and shovel the silt out of their stores. But that is now a closed chapter, and flood-free Plain Dealers can relax and enjoy the multiple benefits of their protected watershed.

Actually, three floodwater structures now protect Plain Dealing, with one of them designed only for flood protection. Another includes 710 acre-feet of municipal water supply, and the third has 595 acre-feet of fish and wildlife water added to flood storage. Extra costs above floodwater storage were paid for with non-Federal funds.

Soil and water conservation measures to protect watershed lands were reported about 80 percent complete at the beginning of



Float that takes fishing groups out on Lake Dogwood.

Note:—The authors are assistant State soil conservationist, Alexandria, and work unit conservationist, Benton, both of the Soil Conservation Service, Louisiana.

Benefits Galore

Louisiana's Cypress Bayou Area

Joe Colvin

1963, by Soil Conservation Service Work Unit Conservationist Joe Colvin, who has been "right-hand-man" technically to all the organizations participating in the Cypress Bayou watershed project. The National Watershed Congress named Cypress Bayou the "Watershed of the Year" in 1961.

Chairman R. D. Hinton of the Dorcheat Soil Conservation District, which sponsored the project, credits fullest cooperation between agencies, groups, and individuals as being "the whole secret of their success." The story began when information about Public Law 566, known as the small-watershed program, under which Federal technical and cost-sharing help is made available to local project organizations by the Soil Conservation Service, was requested by the Plain Dealing Lions Club in late 1955. In early 1956 an organization spearheaded by John Doles, Jr., met with the Dorcheat district

with an application for planning assistance. From there Doles and Hinton "carried the ball" all the way through the State Soil Conservation Committee, of which Hinton also is chairman, and to completion of the project.

A bond issue for \$52,000 was passed by the voters, 149 to 1, in 1956. The watershed plan shows non-Federal expenditures of \$172,377, but if a dollar value could be placed on all the contributions, it would swell that figure manyfold. Family-type recreation, supervised summer health programs, increased community spirit, and the chance of new industry for area development are among the bonus benefits not shown anywhere in the watershed plan.

For example, roads to the lakes were built and black-topped by the Bossier Parish Police Jury across rights-of-way donated by local citizens. The S. H. Bollinger Company donated work crews and

equipment for clearing and leveling the shore and picnic ground. Prisoners were used to clean the underbrush and other debris from the recreational area. Boy Scouts piled brush and planted grass. The Lions Club pays for service of a lifeguard, for whom it built a tower. Seven Plain Dealing citizens went together and bought an 80-acre tract of land to clear up an easement problem..

Women's Clubs have set up budgets to finance developments around the lakes, and Home Demonstration Clubs asked for an area to improve as one of their projects and use for outdoor meetings. The American Legion agreed to share the cost of the bathhouse. The Police Jury is sponsoring a contest for 4-H Clubs, in which the award-winning design for park facilities will be followed.

The project has stimulated community spirit to a new high. As Mrs. Thelma Brando, who works in an insurance office, observed: "People donated labor who have never been known to help with anything before."

Organization of the Plain Dealing Development Association is an outgrowth of the watershed project. One of its first proposals was for a rest home for senior citizens, made possible in part by the availability of 750,000 gallons of municipal water daily from one of the floodwater dams. Secretary-Manager W. E. B. Lockridge of the Association, a retired minister, pointed out, also, that "Every inquiry we get from prospective industries asks about recreation facilities for its employees, and we don't have to apologize on that score."



"Fishin' is good" in Lake Plain Dealing.

Windbreaks Cut Erosion Are Boon To Wildlife

By Albert Neu

FIELD and farmstead wind-break plantings in Minidoka County near Rupert where wind gusts sometimes hit 80 miles an hour are reducing wind erosion and crop damage and providing food and shelter for game and song birds in this Idaho irrigated area. Farmers in the Minidoka Irrigation District, organized in 1916, like these windbreak benefits and, as a result, have planted them throughout most of the area.

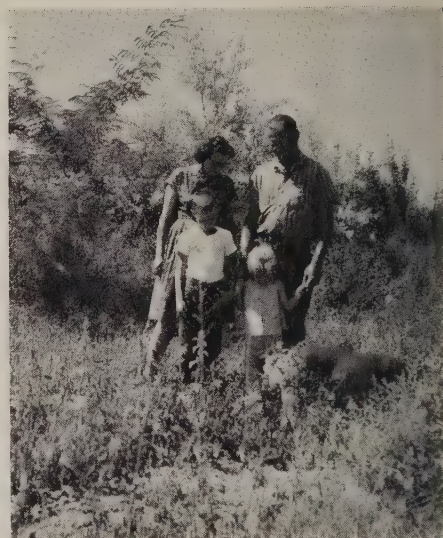
With the discovery of a large supply of underground water in 1947, the Northside Pumping Project was organized. Today, this 78,000-acre project, in 500 farming units, is irrigated from deep wells, with the exception of about 7,000 acres in the southwestern part of the county irrigated by means of a relift pump out of the Snake River. An additional 35,000 acres of private land has been brought under cultivation. All the land has

been developed but a few isolated units.

With land development over the years, native grass cover was removed and the land laid open to wind erosion, which has been serious at times.

Ed Smith, now a supervisor of the Minidoka Soil Conservation District organized in 1955, drew one of the farms on the Northside Pumping Project along about 1953 in one of a series of project land drawings for veterans, and moved his family from Colorado onto their 110-acre homestead 9 miles northeast of Rupert. He recalls that at times during their first year here they couldn't see 150 feet, because of the dust stirred up when many homestead farms were started.

By 1958, he had his farmstead laid out with Soil Conservation Service help and decided to establish a windbreak on the west side



Ed Smith, Mrs. Smith, and son Larry in their 4-year-old windbreak.

of the farmstead. In cooperation with the Minidoka SCD and the Idaho Fish and Game Department, he planted a 4-row windbreak, consisting of Nanking cherry, Russian olive, black locust, and southernwood. The row of southernwood acts as shade and protection for evergreens planted last spring.

By the 1961-62 season, some protection already was provided by the 0.4-acre cultivated and irrigated windbreak planting, which is about 300 feet long and 60 feet wide. An important additional benefit is the food and shelter it provides for game birds. Smith has seen many pheasants in his trees, and doesn't have to go far to get his game when the season opens. Grass will be seeded between the tree rows, to eliminate weeds and provide additional food and cover for game birds the year around.

When the native ground cover was removed as the land was put under cultivation, the game birds lost much of their source of food and shelter, and there has been a definite need to replace it in order to maintain their productivity in the area. The Idaho Fish and Game Department has established several odd-area plantings in the county to



4-year-old Minidoka County farmstead windbreak.

Note:—The author is soil conservationist, Soil Conservation Service, Jerome, Idaho.

provide wildlife food and shelter.

With the wind erosion problem in mind, the soil conservation district board entered into an agreement with the department in 1957. Through this agreement, direct assistance became available for windbreak and wildlife plantings. The Fish and Game Department has carried on an annual program in the Minidoka SCD, where approximately 30 tree plantings are made each year. In 1962, the Walcott Soil Conservation District also

worked out an agreement with the department for help in its tree-planting program.

In the Minidoka SCD alone, there have been about 127 plantings made for individual landowners, consisting of about 48,676 trees—or approximately 66 acres planted in trees and shrubs in nearly 15 miles of windbreaks.

The type of plantings made in Minidoka County consists of four kinds: (1) Farmstead windbreaks of 3 to 5 rows to protect farm-

steads and feedlots; (2) field windbreaks, usually consisting of 1 or more rows, which protect adjacent land from wind erosion; (3) woodlots planted on small tracts that do not fit into the field layout; and (4) odd-corner or wildlife plantings on areas that likewise do not work into the farming program, such as point rows and waste areas. Nearly 20 species of trees and shrubs are used, to give maximum wind protection and provide food and shelter for wildlife.

Town Conservation Commission Is New Resource Improvement Tool

By Lillian P. Sartain

MASSACHUSETTS has come up with a new tool for furthering the welfare of its soil, water, wildlife, and woodlands—the Town Conservation Commission.

Launched under provisions of State legislation, 155 such commissions have been organized and activated from Cape Cod to the Berkshire Hills. In nearly half the eligible State's communities, therefore, they have become civic forces to be reckoned with. Commissioners already have transformed their influence well beyond the talk stage: They've interlocked interests with Massachusetts' 15 soil conservation districts, and town resource guardians are helping to revitalize land protection and development.

By special arrangement, Soil Conservation Service soil surveyors are helping to supply information as to acreage suitability for housing, industry, athletic fields, wildlife refuges, and similar urban needs. When these data have been

processed by State and local planning boards and professional consultants, the commissioners hope they will have helped establish a precise method of conservation planning entire communities.

With 5 million people on 5 million acres, Massachusetts is the third most densely populated of the 50 States. As has been the case

in much of the industrial Northeast, more and more of the Bay State's agricultural lands and other open areas have been vanishing beneath shopping centers, housing developments, and industrial "parks." In addition, the State's network of 25,000 miles of improved roads includes more than 775 miles of land-gobbling turnpikes, expressways, and limited access highways.

It was with an eye on a further population increase of 17 percent expected by 1970 that the legislators authorized formation of the new town units 5 years ago. The conservation commissions are made up of three to seven members, appointed by the local community governing bodies. They have annual budgets of up to \$15,000 apiece, and have a broad assignment. They can hire help; acquire land and water, and develop and manage it under conservation plans; inventory resources, conduct educational campaigns and administer resource programs in cooperation with a wide range of other civic groups and agencies.



Laying plans for pond (l. to r.): Contractor Joseph Dedeo, Vincent Palumbo of Medfield Recreation Committee, Henry Ritzer of the SCS, and Roy Owens and Ellis Allen of Town Tree Department.

Note:—The author is State office secretary, Soil Conservation Service, Amherst, Mass.



Ample parking space like this in Medfield project is important in developing community recreation areas.



Community recreation pond developed by Medfield, Mass., Town Recreation Commission with SCS assistance.

The handiwork of the more enthusiastic commissioners already is visible. In eastern Massachusetts, for example, the town of Weston snapped up widely separated parcels of land and tied them together with a safe, delightful, and satisfactorily long nature trail for local outdoor fans. Nearby Sudbury, famous for Longfellow's Tale of the Wayside Inn, is planning the development of 10 square miles of watershed for wildlife and recreation.

Hingham, on the south coast, has picked up 60 acres of salt meadow—30 acres in the upland and easements along hundreds of yards of streambank. These areas spared from subdivision provide relaxation for townsfolk, and make possible conservation activities such as nature walking and tree planting by school children.

Needs for outdoor recreation continue to have high priority, and most of the commissions have moved initially to link arms with

State and Federal agencies in saving open space. The town of Medfield found this answer to the problem: A former cattail swamp was converted to a model community center for water sports. It features a 1¼-acre pond, sandy beaches, diving docks, a bathhouse, picnicking grounds, and plenty of parking space. In warm weather, it accommodates 200 people a day.

The nature and number of cooperators in the Medfield project illustrate a renewed strength in conservation accomplishment brought out by the local commissions. Among sources of help drawn upon by the town were the Soil Conservation Service, the Norfolk Soil Conservation District, the State Department of Natural Resources, the State Board of Health, and the American Red Cross.

In larger projects, too, the town commissions have shown their mettle. Two commissions are co-sponsoring the Powdermill Brook small-watershed project in south-central Massachusetts. One commission did all the legwork in obtaining easements and rights-of-way. Multiple use is being achieved by means of a park development at one flood-prevention site.

Most town conservation commissions are knee deep in reappraising their renewable resources, and their findings are being injected into a revolutionary approach to master planning in this land of the bean and cod.

Have You Seen?

● "Soil Conservation at Home," by SCS, published by USDA as Agriculture Information Bulletin 244. Because the United States is becoming more an urban Nation, urban and suburban land poses new conservation problems. This bulletin includes "Tips for City and Suburban Dwellers" in dealing with them.

Profit And Fun In Recreation Farming

By R. N. Hoit

ALABAMA dairy farmer J. C. Sharpe has turned his 250-acre farm 6 miles north of LaFayette into a profitable recreation center called Dizzy-Land and is having the time of his life operating it. And he's working fewer hours and making more money than he did from his dairy.

"I really enjoy what I am doing," Sharpe says. "I look forward to every day with enthusiasm. This kind of 'farming' is fun. Running a dairy is hard work any time, but especially when labor is scarce and you have to do most of the work yourself."

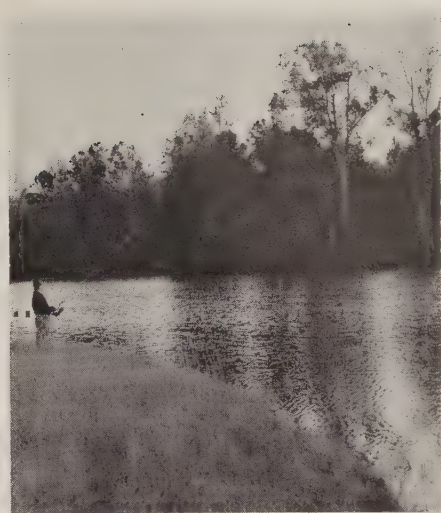
Sharpe, who became a cooperator with the Piedmont Soil Conservation District in 1940 and completed a basic plan with the district, was a row-crop farmer and dairyman for 21 years. He operated a 32-cow dairy from 1940 until 1954, when he converted his

farm into a recreation center, a changeover he actually started 3 years earlier.

Today he has six ponds totaling 40 acres of water. He received help from the Soil Conservation Service through the district in planning, designing, and supervising the construction of these ponds.

He also has a 75-acre recreational area consisting of a golf course, a playground, picnic tables, a concession stand, and a meeting place for clubs and other organizations. There are two softball fields and facilities for such games as horseshoes, badminton, and shuffleboard. He caters mainly to church groups, family reunions, and clubs. Individuals and small groups, however, also are welcomed.

Swings, rides, games, and all the equipment on the recreational grounds are homemade. Sharpe used old farm equipment and tim-



One of 6 lakes at Dizzy-Land.

ber from the farm to build them. He has no motor driven equipment, because it would require additional labor for supervision.

When Sharpe decided to convert his farm into a recreational area, the pastures were changed into an 18-hole golf course with sand "greens." He says that he can still see effects of the fertilizer and lime he applied to the grass while it was being used as pasture. He keeps the fairways mowed with a tractor and mower formerly used on the dairy farm. Sharpe is his own "pro," playing regularly with customers. He shoots par or better.

This "diversification" isn't exactly something new with the Sharpes. From 1940 to 1946, Mrs. Sharpe baked and sold enough pound cake to build a new \$6,500 house. Their old home now serves as a club house.

Why did Sharpe give up farming for the recreation business? There were several reasons, he said. Labor was just one.

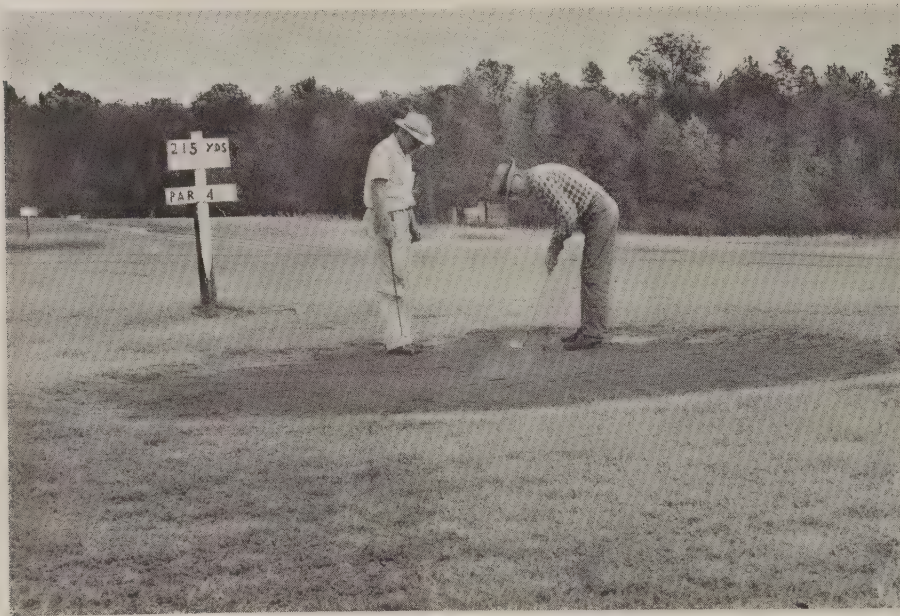
"This is something I can do with the help of one man," he explained. "I couldn't run the dairy by myself, and it was hard to keep help and to clear enough to pay for labor and still make a profit.

"Also, with more leisure time,



One of the homemade rides at Dizzy-Land—as long as the kids want for 10c admission.

Note:—The author is State soil conservationist, Soil Conservation Service, Auburn, Ala.



Golfers on Sharpe's former cow pasture golf course.

more people are looking for private, uncrowded places where they can take their families for a day out of doors; and they are willing to pay reasonable fees for the priv-

ilege of enjoying fresh air, sunshine, and relaxation.

"I figure that by making recreation my 'money crop,' I am providing something needed by the

growing population, and I'm having fun doing it."

Sharpe charges admission—10 cents a person—to the recreational area, and a 50-cent fee for golfing or fishing. He operates a concession stand selling soft drinks, candy, and cookies. An old milk cooler is now a soft drink box. The business advertises itself through users' telling friends. They come mostly from LaFayette and Roanoke, Ala., the Chattahoochee Valley towns, and nearby counties in both Alabama and Georgia.

Sharpe's experience has proved that farm-based recreation for profit will pay off.

"My income now is about double what it was when I was in the Grade A milk business, and it's getting better every year," he reported. "School and church groups, clubs, and family reunions keep Dizzy-Land overflowing. Every week-end next summer has already been booked."

Kids' Ranch Camp Outpays Farming

By Walter S. Allen

ONE North Carolina farmer has found his biggest and best cash crop to be kids—the two-legged kind.

From June through August, up to 80 children at a time spend 8 action-packed hours a day at Lake Haven Ranch Camp in the Morning Star Township near Matthews. The ranch bosses are Mr. and Mrs. Dan Hood—both farmers, youth counselors, and lovers of children.

Most of the children who visit the East Mecklenburg County ranch camp are 8- to 16-year olds from close-by Charlotte or Monroe, who enjoy new experiences on the

farm every day. Some are resident campers, and others ride the ranch (station) wagon to the camp and back to their homes each day. It's all girls among the residents for 4 weeks, and then the "cowboys" take over for 8 weeks.

They all get the most fun out of doing what farm children grow up doing every day—riding horses, feeding the cows and chickens, helping with the milking, and especially rounding up the cattle. Of course there also are the conventional camping activities—swimming, fishing, riding, archery, arts and crafts, nature study,



The Hoods on the job at their summer camp.

hiking, and rifle practice.

But the farm angle intrigues the young campers most. Somehow, those cows just keep straying off and have to be rounded up. The mules, the tractors, the chickens, the dogs, and even a few burros add to their enjoyment, and some-

Note:—The author is field information specialist, Soil Conservation Service, Spartanburg, S. C.

times amazement.

The Hoods pondered the ranch camp idea for their farm for a long time before they put it into effect 4 years ago.

"It used to be that the city folks would take their kids out to the country to see their grandparents," Mrs. Hood said. "Now grandfather, grandmother, and most of the other relatives are all living in town, too."

As the demand for more outdoor recreation for the young people of Charlotte and other cities increased, Hood saw the opportunity to serve the community and at the same time add to his farm income. He had tried for years to make a success of the 300-acre farm in a similar manner to his grandfather's method—growing cotton, corn, and other row crops.

"One day back in 1944 after water washed out a gully 45 feet wide in my cottonfield I decided to make some changes," he recalled.

Hood discussed his problems with the Soil Conservation Service technician in the Mecklenburg County Soil Conservation District, who advised converting the row crop land to fescue and clover pasture, building terraces and farm ponds, and improving his pine timber stand. Hood has good reason to be happy that he took that advice. The grasses and terraces stopped the erosion. Nine ponds fed by natural springs were developed. The timber has thrived.

Hood established a dairy herd, which he still maintains. But he says he has a better income from the camp than from the dairy.

"I've got 50 children coming out here today for a weekend camping trip," he commented one Friday. "They'll pay me more than I used to get for two bales of cotton."

When it's chow time, a big farm bell rings and all the little "cowboys" or "cowgirls" scamper for the chowhouse to put away double helpings of fresh vegetables and other farm-grown food. Hood



Rounding up the cattle on Lake Haven Ranch Camp farm.

knows a lot about preparing and serving food, because at one time he was manager of a restaurant in New York City, where he also attended Columbia University. Mrs. Sanford Morton, a member of his staff, is a former school dietician.

Mrs. Hood was a Girl Scout leader for years, and recruits some of the camp's best counselors from her former Girl Scouts.

The Hoods have turned their camp project to good account in inspiring young folks to build up their self reliance, relax, and enjoy the simple things. They will tell you that their biggest thrills come from helping other people's children enjoy for the first time the many fascinating things that take place on American farms every day.



Young campers get boating instructions on one of 9 spring-fed lakes developed on the Hood farm.

Watershed Reservoirs *Draw Paying Customers*

by Sellers G. Archer

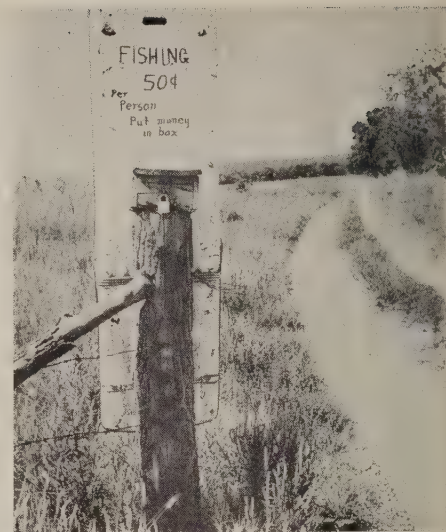
SEVEN flood detention reservoirs on the Six Mile Creek Pilot watershed project in western Arkansas attracted paying customers who spent 9,500 fishing days there in a single year. For the privilege, they paid the landowners \$7,125 at 50 cents to \$1 a day each. Much of the money was deposited in collection boxes while the farmers went about other business.

Another reservoir is leased to employees of a public service company for \$800 a year by William Magerlein, owner. The group has installed camping, boating, picnicking, and other facilities. One reservoir used by Bonneville as a supplemental water supply, is open to fishing without a fee, and is heavily used. Another

structure, owned by Jack Corley, a supervisor of the Magazine Soil and Water Conservation District, entertains youth and church groups, clubs, and neighbors at no charge. Twelve other reservoirs are restricted to the use of friends and neighbors.

An overall cost to a fisherman of \$3.50 a day is an accepted figure in this area—less the amount of a fee when fishing privileges are free. Consequently, in addition to \$7,925 they paid to the landowners, these Six Mile Creek watershed fishermen alone enhanced the local economy an average of about \$3 a day each for bait, tackle, boats, trailers, gasoline, food, and other necessities.

Multiply this figure by 29,300—the estimated number of fishing



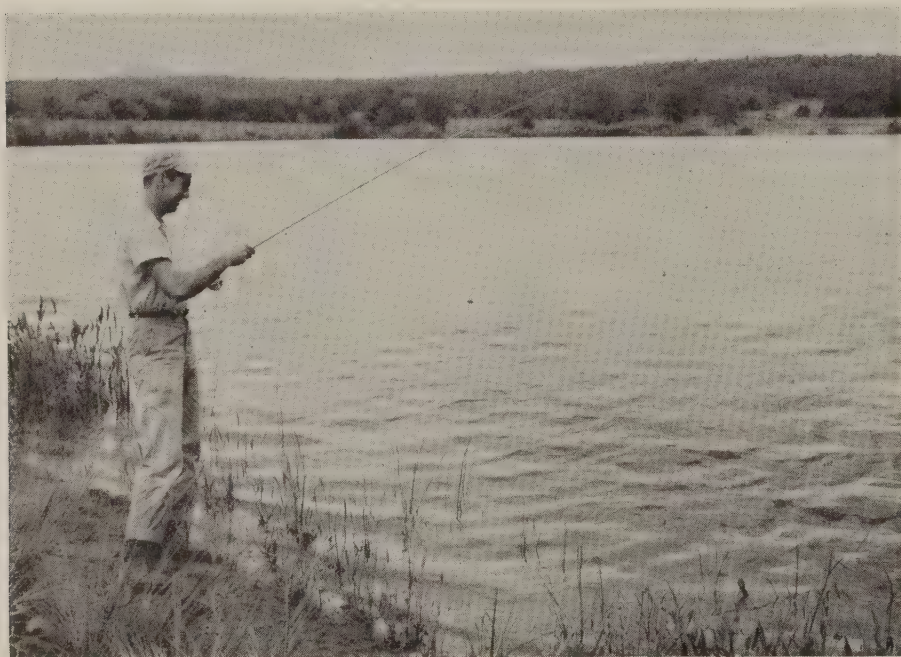
Ed Flanagan has found that fishermen using flood-detention reservoir on his farm are honest.

days provided by all of the reservoirs in the watershed in a year—and the total is about \$88,000 going to suppliers of the many services and goods that fishermen need. This added income from recreational use of watershed protection and flood prevention developments represents a substantial boost to business in the area. It is in addition to the business realized from new industries attracted to the area as a result of the watershed project developments. (See *SOIL CONSERVATION*, January 1962.)

Much of the sportsmen's money went into about 500 boats, 100 trailers, and 100 outboard motors reported sold in the area since the watershed reservoirs were built.

But the story is not all told when the fishing is accounted for.

Owners make no charge for boating and hunting; but in 1961, the latest full year for which figures are available, there were an estimated 4,000 man-days spent in frog-gigging, 1,600 days hunting deer, raccoon, and waterfowl, and 500 days of boating and water skiing. There likewise was no charge for 6,500 swimming days and 3,500 days of camping; but



This 40-acre watershed reservoir is used as supplemental water supply for Booneville and is open to fishing without charge.

Note:—The author is field information specialist, Soil Conservation Service, Spartanburg, S. C.

some additional expenditures were involved in most of these various recreational activities. Total recreational use of the watershed for the year was estimated at about 45,000 man-days.

Recreational use of the watershed has not reached its maximum, nor has the income to landowners

reached its potential. Only time will tell what it will be.

"Recreational use has been important in the watershed structures," says William B. Davey, State conservationist for the Soil Conservation Service, through which Federal technical and financial help was provided for the

local watershed project sponsored by the Franklin County and Magazine (Logan County) soil and water conservation districts. "In the past we have greatly underestimated this feature in rating the full potential of watershed projects. And, most importantly, this land is still on the tax books."

New Hope for Urban Area Wildlife

By James S. Bennett

WILDLIFE land use in crowded northeastern Ohio urban areas is being stepped up by the simple means of increasingly popular tree and shrub planting "packets" distributed by soil conservation districts.

The wildlife packet idea was started in Ohio by the Ashtabula Soil Conservation District, where the packets were sold to district cooperators for planting as a specific part of their conservation plans. This is still an annual project carried out by this district; but the Cuyahoga and Summit districts in the Akron-Cleveland area now make the packets available to any landowner who will promise to plant them. Other districts in northeastern Ohio prepared to sponsor wildlife packets in 1963.

During 1962, approximately 900 urban families bought wildlife packets from the districts and planted them for food and cover for wildlife. Most of the plantings were on small tracts, of 1 to 5 acres, where housing developments have eliminated most of the protective cover for insect-eating birds and animals.

A wildlife packet is simply an assortment of trees and shrubs that have been selected as a desirable cover for wildlife. The district

buys the planting materials in wholesale lots from local nurseries, and the supervisors package them. Because many of the landowners



Cuyahoga SCD supervisors wrap wildlife packets. (Upper l. to r.): Howard Starkey and Neil Richardson; (lower); Earl Foote, George Johnston, and Charles Snow.



need advice as to how the planting should be done, the district provides a sheet of instructions with each packet.

The landowners may choose between two or three different packets. For example, packet A in 1962 included: 25 white pine; 25 Austrian pine; 25 Scotch pine; 25 Norway spruce; 25 Colorado blue spruce; 7 symphoricarpus; and 7 Red Osler dogwood.

During the past 3 years, the Cuyahoga district sold packets to 1,264 urban landowners. The packets consisted of Austrian pine, 46,225; Scotch pine, 17,150; Norway spruce, 46,275; Colorado blue spruce, 18,125; multiflora rose, 93,750; Red Osler dogwood, 4,843; symphoricarpus, 4,843; cotoneaster, 725; regel privet, 725; euonymus, 3,570. This distribution indicated that approximately 1,300 acres was planted to wildlife cover in the Cleveland metropolitan area alone.

In 1962, the first year the Summit district made packets available, more than 475 landowners bought them.

Soil Conservation Service technicians assigned to the Cuyahoga and Summit districts agree that the wildlife planting packet program fills a real need in urban counties. It not only is a means of converting some open land to a useful purpose, but also helps the

Note:—The author is ass't. State conservationist, Soil Conservation Service, Columbus, Ohio.



Strip-mine pond, stocked with bass and bluegills, with pine and locust wildlife area plantings.

Mississippi Farmers Cash in on Recreation

By Rose Fleming

FARMERS in many sections of Mississippi are cashing in on recreation as the most profitable use of some of their land.

They are building ponds and stocking them with bass and bream, providing boats, and renting fishing privileges. Some are raising quail or pheasants. Others are developing land for dog training or charging for hunting in season.

Is this profitable for the farmer? What are his expenses? How does he feel about this new business of recreation on the farm? Typical answers to these questions are provided on a day's tour of farm ponds and lakes near Jackson. All these farms are owned by soil con-

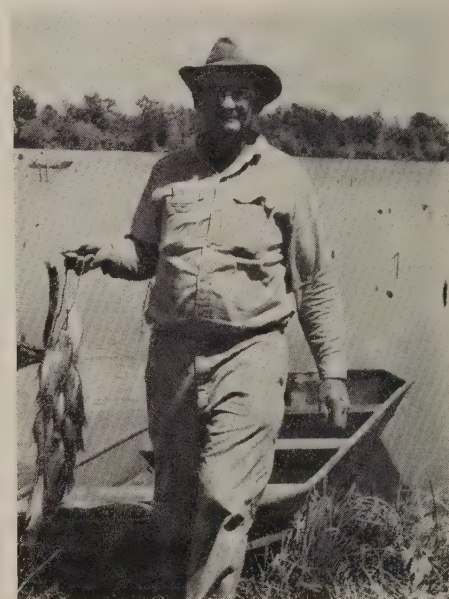
servation district cooperators who have developed conservation plans with technical help of the Soil Conservation Service.

Lake Rosa R at Bolton is one. People fish here year-round. Owner J. B. White, raising beef cattle and soybeans on his 5,200-acre farm, apparently thought well enough of his original plunge into a recreation project to undertake another. He opened a second lake—Cecil J—in March 1962, and soon began constructing a third. But, he cautions, lake operation is not for the farmer who has to have a "quick return."

For one thing, he found that fertilizer and boat costs and repairs come high. Then the cost of building a lake can be high. White

districts in obtaining new cooperators—an estimated 30 to 40 in the Cuyahoga district, for example. In addition, the districts are able to make a little profit on the packets, as the supervisors donate the labor. With the proceeds, the districts have been able to purchase and distribute quantities of educational bulletins to the city and county schools, and to send youngsters to conservation camps and other much needed conservation educational projects in urban areas.

"This project has proved one thing," in the words of one Cuyahoga supervisor, "and that is the fact that urban people are still very much interested in conservation and will do something about it if given the chance."



Owner J. B. White with fish catch from Lake Rosa R near Bolton, Miss.

built Cecil J in hilly country, where it was necessary to excavate 61,000 cubic yards of earth and build a levee 32 feet high. He was fortunate enough to have two bulldozers he could use to move this earth, but other farmers might need to give careful consideration to this outlay for construction.

There are 31 boats on White's

Note:—The author is writer-editor, Soil Conservation Service, Jackson, Miss.



Mississippi fishermen Lacey Hughes (l.) and J. L. Clark of Jackson get set at S Bar C Ranch near Canton.

two lakes. He charges a fisherman \$1 a day to fish, plus \$1 for a boat if he rents one. Fees are payable at the corner store which the family operates. Even so, during fishing season, White spends about 2 hours a day in lake supervision. When the Cecil J Lake opened, a record crowd turned out; 10 days afterward, he signed in 330 fishermen.

Vance Lake near Edwards has helped its owner, J. M. Vance, pay for a modern brick home on the lake front. The primary source of income for the farm is a laying-hen operation.

Opened in 1959, this lake draws family parties. Vance piped deep-well water to picnic areas under the moss-hung trees along the shore, and put in electrical connections for radios, hot plates, and coffee-makers. At the gate his honor box receives cash deposits from the fishing parties—\$1 a day for each fisherman. There are few violaters. Boats are free as long as they last. Vance does not allow night fishing.

Mississippi's mild climate allows almost year-round fishing; but during extraordinary freezes, parties even have built fires on the lake bank and chopped holes in the ice to fish for crappie. Deepened lake edges and plenty of fertilizer so far have produced a good crop of fish. Vance has done all the construction around the lake himself

—including piers, boat house, and a cabin where he stores his own fishing equipment. He says clean-up and repair jobs around the lake take about 8 hours a week.

The Vances both like to fish, and say their fishing business is more play than work.

Lake Sherlee, owned by Roger W. Stribling, Jackson equipment dealer, is a peaceful spot for weary businessmen, who can make the drive to Mansdale in half an hour. His fishing charge is \$1 a day for each person and a \$1 a day for a boat. Frequently 40 or more people are fishing the lake at the same time. On weekends, the Striblings allow water skiing on the mile-long skiing area.

The Striblings live in Jackson and operate their beef cattle farm as a sideline. The lake originally was intended for their own family's recreation, but it has developed into a small business.

The S Bar C Ranch near Canton, owned by the Southern Cattlemen's Association, has a choice lake patronized by local people as well as by visitors from neighboring counties; but the lake area also is being planned for State and national field dog trials and for professional dog training as



Manager J. F. Stout with young dog being trained at S Bar C Ranch, which has horses and guides for bird hunters.

as well as for hunting. Manager J. F. Stout, who operates the 4,000-acre beef cattle operation, is proud of the fact that in 1962, a dog he owned and trained on the S Bar C—Primos Rowdy—was runner-up for the national amateur championship.

The S Bar C furnishes guides and horses for hunters. It costs two men \$50 for an afternoon's quail hunting. The fee for dove hunting is \$5 a gun for an afternoon. Feed plots of field peas and brown-top millet furnish food for quail, and plots are also planted for doves.



Roger W. Stribling's Lake Sherlee near Mansdale is one of Mississippi farm ponds that bring owners added income from fishing fees.

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USDA Moves Ahead On Recreation

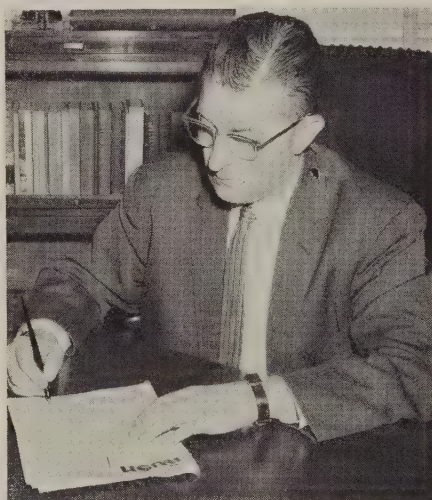
By John A. Baker

THE Department of Agriculture is interested in recreation development on farms for four primary reasons: (1) It offers a chance to provide additional income to farmers and associated businesses and may help some farmers to stay on their farms; (2) it can aid in diverting cropland to a more profitable use for the owners; (3) it provides an urgently needed service for urban as well as rural people and farmers and nonfarmers alike; and (4) it can help improve the economy of a community and contribute to rural areas development.

The Department's recreational assistance will be available to farmers or groups of farmers who want to develop income-producing recreational enterprises and to small watershed project sponsors who want to develop public recreational facilities as part of the watershed work plan.

To individual and groups of farmers wishing to develop income-producing recreational facilities on their farms, the Department, through the Soil Conservation Service, will provide technical

assistance relating to the new uses of the land and water. The recreational development will be included in the overall conservation plan for the farm unit.



Assistant Secretary of Agriculture
John A. Baker.

The Soil Conservation Service will draw upon the experience that the Forest Service has accumulated over the years in developing specific recreational facilities in the national forests and that of State agencies, many of which have long experience in this field. The Farmers Home Administration is authorized to provide long-term individual loans and also loans to

groups for recreational developments. The Agricultural Stabilization and Conservation Service is authorized to cost share certain recreational measures.

In small watershed projects, sponsoring groups may obtain cost-sharing assistance up to 50 percent for enlarging a reservoir for recreational purposes, acquiring necessary land rights, and building minimum basic facilities. Cost sharing on minimum basic facilities may include boat docks and ramps, beach development, sanitary and power facilities, roads, trails, parking lots, public water supply, and similar developments.

Funds are available and the Department is ready to move ahead on the new recreational phase of the watershed program. Already sponsors of more than 30 small watershed projects are definitely planning to include recreation in their projects.

Recreational developments are not something to be taken lightly. Tourist expenditures have been estimated at about \$25 billion annually. People are seeking the out-of-doors as never before. They want to fish, boat, swim, camp, and picnic, and they want these places close to home.

Note:—The author is Assistant Secretary for Rural Development and Conservation, U.S. Department of Agriculture, Washington, D.C.

APRIL 1963

Soil Conservation



SOIL CONSERVATION SERVICE • U. S. DEPARTMENT OF AGRICULTURE



Soil Conservation 25 Years Ago

"It is evident that the 'stability' of a gully may be described more accurately as 'dormancy.' To prevent rejuvenation or the renewal of excessive cutting, the watershed of the gully must be protected. This may be accomplished by cultivation practices designed to prevent excessive runoff, by revegetation, or by building up the organic content of the soil. The valley below must also be protected in order to prevent the stream from lowering its present base level. An increase in the water supply in any part of the drainage system beyond its normal capacity is therefore a potential source of danger.

"Therefore . . . one may say that a gully is stable, not when the walls and head have ceased advancing, nor when the channel of the gully has ceased cutting downward and is filled with growing vegetation, but only when all precautions have been taken to prevent renewed cutting and the consequent introduction of a new cycle of erosion."



COVER PICTURE. — Floodwater dams like this one on the Ray Tucker farm in the Plum Creek watershed near Finchville, Ky., are being planned and built at an ever-faster rate in small watersheds across the country, providing, also, recreational, municipal, and industrial water supply, and other public and private benefits.

—Photo by E. W. Cole

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Soil Conservation

ORVILLE L. FREEMAN
Secretary of Agriculture

DONALD A. WILLIAMS
Administrator, Soil Conservation Service

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FRANK B. HARPER, Editor

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Watershed Lands and Water Are Everybody's Concern

By Donald A. Williams

ALL those who share in the ownership or management of the Nation's land and water resources today must cope with tremendous new challenges. They have been brought about by our magnificent technological advances, rapidly expanding population, increasing urbanization, and shifting land use patterns—all of which combine to place new and competing demands on our remaining land and water resources, which are the very foundation of our economy and our standard of living.

Our land and water resources are vital national assets. How we conserve, develop, and manage these natural resources will affect our economic growth, the strength of our Nation, and our longrun status in world affairs. The basic resources of land and water serve all the people of the Nation. Land and water problems are of increasing concern to both farm and non-farm people. Carefully planned programs to satisfy both rural and urban needs are essential.

The interrelationship between farm and nonfarm interests in resource conservation, although a truism from the beginning, has come to be recognized only in recent years. Today, more and more people realize that "city" conservation problems and "farm" conservation problems are not separate and distinct problems. They are so interrelated that one can scarcely tell where a rural conservation problem leaves off and an urban conservation problem begins.

We know, for example, that just

about all of our water falls on the land, for less than 2 percent of the Nation's total area is in lakes or streams, and that three-fourths of this land on which all our rain and snow falls is in private ownership and 60 percent is in farms and ranches. Management, use, manipulation, and development of our water resource, therefore, begins largely on the privately owned lands.

This is the water that grows our crops, provides forage for our livestock. This is the water that carries away soil through surface runoff, that sweeps it into streams and lakes where it creates additional conservation problems. This is the water that serves our cities and our industries. This is the water that floods our valleys and our towns

and cities. This is the water that provides all our water-based recreation, our fishing, boating, and swimming. This is the water that provides much of our power. This is the water that feeds our navigable streams.

Our growing awareness of the interlocking interdependence of land and water resources and of rural and urban interests in developing and protecting those resources has come about in several almost simultaneous phases. One of these is the greatly increasing nonagricultural use of land to provide space for our expanding population in which to live, to work, and to play. These new users of land almost immediately become involved with firsthand conservation responsibilities. The developer



Spreading subdivisions from coast to coast—like these in Santa Clara County, Calif.—bring land and water conservation needs home to city people.

The author is administrator, Soil Conservation Service, Washington, D. C.



A floodwater-retarding structure in Thompson Creek watershed in Tennessee's Henry SCD.

of a housing area, the builder of a factory, and proprietor of a golf course—in fact, every land user in city, suburb, or rural area—is and must be concerned with the soils and the water behavior at his particular site. More widespread understanding of the watershed approach is another reason for our improved attitude toward orderly development and management of our renewable natural resources.

Like every other country, the United States is physically a Nation of watersheds. Our longest rivers and their tributaries drain large areas. These areas are usually called river basins or drainage basins. Each major river basin is divided into several lesser watersheds, and each of these, in turn, is subdivided progressively into smaller and smaller watersheds down to those where surface waters first begin to collect.

We have come to realize that no two watersheds are exactly alike, that each one is an intricate, complete unit of Nature governed by natural principles that men can modify but never abolish or ignore. We have learned that action taken anywhere in a watershed that affects one resource will inevitably affect other resources. The chains of cause and effect in a watershed

are numerous, long, and far-reaching. We know that efforts to use, conserve, and develop renewable natural resources without regard for watersheds and natural principles are certain to be costly and are likely to fail.

In addition, we have come to realize that our land and water resources can serve present and future needs of all interests only through application of the prin-

ciple of multiple use. When storing water, for example, wherever feasible we should provide for all possible uses of an irreplaceable site instead of only a single use. Water supply, flood prevention, recreation, fish and wildlife, industrial development, irrigation—these are a few of the use combinations possible under the multiple-purpose principle.

Perhaps most important, in the development of our present enlightened attitude, is the conviction that the ideal arrangement for resource development is a cooperative one involving the community, the State, and, where necessary, the Federal Government. This three-way partnership has been successfully demonstrated for more than 25 years in soil conservation districts. The same principle is at the heart of the small watershed program, which was authorized by the Congress in 1954 as the Watershed Protection and Flood Prevention Act.

Today we are better prepared to tackle our renewable natural resource problems than at any time in our history. This is so because we have developed a better public understanding of how to do the job.



Watershed dam and lake in Old Tom Creek watershed project in Henderson County, Ill.



Popular recreation area of watershed flood-prevention lake in Collin County, Tex.

It is so because we have progressive State and Federal legislative tools and programs that provide for coordinated, long-range planning involving every segment and interest of our society, including several new authorities given the Department of Agriculture in the 1962 Food and Agriculture Act, that will be helpful in rural areas development and soil and water conservation work everywhere.

The small-watershed program, Public Law 566, was amended so it is now possible for the Soil Conservation Service to provide cost-sharing for water-based recreational developments in watershed projects. Funds can be advanced to acquire critical sites for water impoundments, and to provide municipal and industrial water supply.

Congress authorized changes in the Bankhead-Jones Farm Tenant Act which will permit locally sponsored Resource Conservation and Development Projects, when funds are provided, for carrying out a program of land conservation and use, under SCS leadership, in areas where acceleration of the present conservation activities plus the use of new authorities would provide additional economic opportunities to the people.

Congress similarly authorized a

cropland conversion program that provides for long-range land-use adjustment programs, including conversion of presently unneeded or unsuitable croplands to other uses, such as for growing grass or trees. This program, with SCS technical help through soil conservation districts, will be headed by the Agricultural Stabilization and Conservation Service.

Congress provided for technical, cost-sharing, and credit assistance in establishing income-producing recreation enterprises on farm and ranch land.

The other new tool it provided is a Rural Renewal Program, under which projects can be developed locally that are aimed at relieving underemployment, strengthening family farming, and developing natural resources to assure permanence of the economic gains. The program will be handled by the Farmers Home Administration.

Most of us are land users in one way or another. When we all understand that each handful of soil, each raindrop, and each piece of land is intimately related one to another, when we are all armed with our present day conservation know-how—then indeed we will have the true and lasting answers to our natural resource problems.

10th Watershed Congress

“Understanding—Key To Progress” is the theme of the 10th National Watershed Congress to be held in Philadelphia, Pa., May 26-29.

The Congress is sponsored by 27 national organizations, including the National Association of Soil and Water Conservation Districts. It brings together top authorities and representatives of organizations concerned with agricultural, community, and related water use and management from throughout the country.

Although it does not adopt formal resolutions, the Congress’ participating organizations and other interests work at the local, State, and national levels year-round in behalf of water-conservation developments and policies projected in its annual discussions. These deliberations center on current water problems and opportunities that arise in soil conservation districts, watersheds, river basins, and elsewhere in the country.

Representatives of organizations having an important interest in public opinion on and attitudes toward water problems will take part in question-and-answer discussions, and a panel of speakers representing key interests and purposes in watershed and river basin development similarly will answer questions from the audience.

Initially scheduled session themes include those on resource and watershed understanding and avenues of resource development. Also on the program are talks and discussions on the Delaware River Basin compact and the Brandywine Valley program.



Extension Horticulturist E. C. Wittmeyer of Ohio State University reports vegetable and potato growers often wait too long to apply irrigation water. He says that often a small application of water early in season will pay large dividends at harvest time.

Watershed Project Brings Many Community Rewards

By Gordon S. Smith



Leaders in project development (l. to r.): Town Manager Donald Chick; Ex. Sec. Edgar Ellingwood of Keene Regional Industrial Foundation; Pres. Edward Fairbanks of Regional Foundation and local developer; George Kingsbury, businessman and former SCD supervisor; Mayor Robert Mallet; and Ex. Sec. John Sias of Keene Chamber of Commerce.

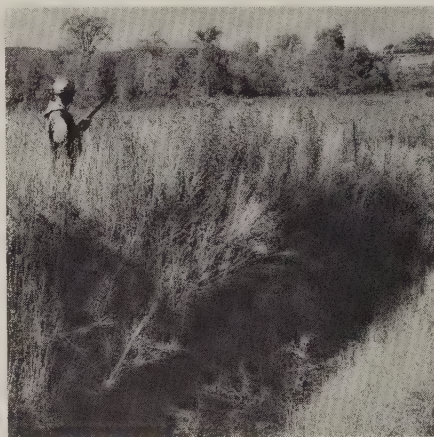
PLANNERS of New Hampshire's industrial city of Keene are finding that their recently finished Ash Swamp Brook watershed project is yielding dividends well beyond its basic flood prevention objectives.

Boosted tax revenue, better farming conditions, reclaimed land for home and industry, improved roads, wildlife enhancement, and mosquito control are a few of the community economic and other rewards stemming from the watershed project. It involves a wide valley section of Keene's western suburbs.

Melting glaciers, a few thousand years ago, plastered a mixture of clay, silt, sand, and gravel over granitic bedrock. The end product was good soil but one that was too

wet for either profitable farming or city expansion in the 700-acre valley. Water from winter snows and summer rains swamped the potentially valuable valley several times a year. Stagnant water scalded farm crops, ruined pasture grass, swamped roads, and soaked home basements for days with each flood. The damages averaged \$8,000 a year for the town.

Edward LaBonty, a Cheshire County Soil Conservation District cooperator, really started the water-



Ash Swamp watershed project has improved wildlife habitat.

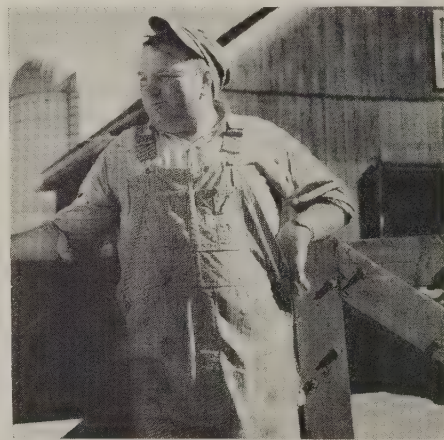
shed project idea on his farm near the edge of Keene when Soil Conservation Service technicians helped him plan a drainage improvement system he wanted for a 20-acre field. A few civic leaders saw the results and sought similar help on larger areas of the wet valley.

With backing of the City Planning Board, the Chamber of Commerce, and the Keene Regional Industrial Foundation, the request grew into one of New England's first flood prevention projects under the Watershed Protection and

Flood Prevention Act. The Act enabled the city, with local soil conservation district cosponsorship, to obtain Federal technical and cost-sharing help through the SCS.

A network of new channels was designed as the backbone of the 20-square-mile improvement plan. Seven miles of main channels and 3 miles of lateral ditches were needed to ease excess water out of the wet areas into nearby Ashuelot River. Upland conservation measures—planting trees and improved pasture grasses, individual farm drainage improvements, and building farm ponds—were an important part of the overall watershed protection plan. Landowners are continuing this work as their contribution to the project.

Arthur Whitcomb, a local contractor, moved nearly 140,000 cubic yards of earth to form the channels. Total cost for earthmoving and reseeding was \$148,642. Local funds paid 35 percent of this total. Eighty-eight land easements, costing the city \$10,000, were needed



Evans H. Barrett, SCD cooperator and Keene councilman, worked on project plans in town and on farmland.

The author is field information specialist, Soil Conservation Service, Upper Darby, Pa.



More than 700 acres of improved land like this formerly was too wet for harvest of good hay crops.

to clear the right-of-way before construction. In all, Keene paid \$75,000 for the project and assumed future maintenance costs.

On the farming end of the watershed, the 1962 growing season pointed to future expectations from the improved water management and flood protection. As Evans H. Barrett of the Keene City Council, and a dairyman for 40 years, said:

"There was more snow than usual, but the new system made it possible for us to get out on the land 3 weeks earlier than ever before. Our corn production last summer was three times larger than normal. That means we don't have to spend money to buy feed now. But, even more important, our marginal land can be turned into prime pastures with this lower water table."

He figures about 1,000 acres in the watershed will be improved as farmers tie new farm systems into the watershed channels.

Similarly impressive results of the land improvements can be found in town. For example, Edward H. Fairbanks, a land developer, is building a million-dollar shopping center. He had started the project with a supermarket a few years ago, but tons of fill were needed to make even a small seg-

ment of the property usable then.

"We have been able to develop our land much sooner than originally intended, because of the watershed project," Fairbanks pointed out. "We have more land available for parking space now, which means larger retail floor space in the shopping center. Consequently, we will be paying taxes on improved land for commercial

purposes that otherwise could not have been developed, because of the high water table. We consider the Ash Swamp project one of the best investments our city has made in a long time."

It is estimated that such tax increases will more than pay the local costs of the watershed project in less than 5 years. And they are only one of many economic improvements in the community.

One group of landowners, for example, is planning to improve land that will be used for a multi-unit housing development. A new bypass highway was built around Keene at a lower cost to the State, because it passed through land that had been improved by the project. New motels promptly were planned along the bypass to accommodate tourists and businessmen.

Local wildlife enthusiasts are equally happy with the project results. Hunters report an increase in pheasants and rabbits in the valley, and wildlife experts note that the lower water table has actually improved habitat and food for birds and small game, including seeding a wildlife food mixture along the new channel banks.

Benefits from Keene's watershed



Supermarket in center of this area once too wet for development is being surrounded by 13-store shopping center from which taxes are expected to pay watershed project costs.

project have just started. New industry, attracted by the progressive community, is expected to swell the city's 5,000-job, \$18-million-a-

year payroll. New schools, recreation centers, and other municipal improvements can be built with the increased tax receipts and the

money saved from flood damage. In these and other respects, Keene has the promise of a brighter future with its economy on a safer footing.

Ranch Watershed Job Pays Good Dividends

By Robert Dellberg

WATERSHED runoff can cause a sheep ranch a heap of trouble if something isn't done about it. And that's the fix the Guntly brothers near Ukiah, Calif., were in before they learned how to handle water.

A watershed rising above a 26-acre field on the ranch stirred up all kinds of trouble for John Foster Guntly and his brother, Charles. After heavy rains, water ran off the slope as though it were a tin roof. As the water flowed across the field it cut gullies up to 25 feet wide and 20 feet deep.

With such flooding and gullying happening just about every year, the field couldn't be irrigated efficiently and, without water, produced smaller and smaller grain crops under dry farming. That can mean trouble when you've got a lot of hungry sheep and lambs to feed. As Foster Guntly said: "We'd plant a sack of grain and harvest a sack."

Gullies split the fields into three separate lots. You couldn't go from one field to another without using an adjoining road.

The Mendocino County Soil Con-



Big gully that no longer is!

servation District drew upon the Soil Conservation Service to help the brothers plan a series of five drop structures at the base of the watershed. The specifications called for 36-inch corrugated pipe to carry runoff safely to a grassed waterway.

The plans also provided for conservation treatment of the watershed, including fencing and regulated grazing to give cover a chance to come back. Planting of woody vegetation on the hillside to prevent silting of the field below was another erosion stopper tied into the control plan.

The Guntlys carried out their plan with good results. Gullies were smoothed over and seeded, runoff was controlled, and an irrigation system was installed. The formerly low-producing field was planted to a standard pasture mixture, which had not been possible before these changes were made.

Those 26 acres are now one large field with nothing to hamper working it efficiently. The gullies are gone, and in their place are grass swales which make it easy for



John Foster Guntly in reclaimed field. Grassed waterway at right carries runoff from hills.

The author is woodland specialist, Soil Conservation Service, Ukiah, Calif.

equipment to pass over. Former District Director Guntly says: "This conservation job has changed 26 acres of gullied grainland nobody would want for \$5,000 for the whole shebang into irrigated pasture worth every cent of \$1,000 an acre."

Before they got the pasture, the brothers usually sold many of their lambs as feeders. Now they feed up to 350 at a time for about 6 weeks and sell them as fat lambs. The lambs go in at about 65 pounds and come out at about 80, the gain representing one more dividend from the Guntlys' watershed conservation investment.



Sprinkler irrigation ready to be started after construction, fertilization, and grass seeding were completed.

Watershed Conservation Insures City Water Supply

By Willis J. Ridenour

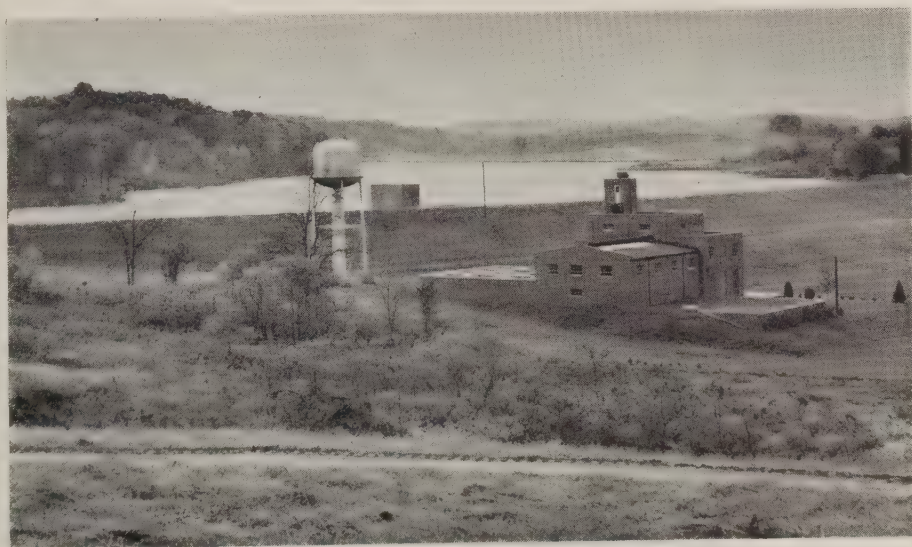
TO the saying that "rain falls on the just and unjust" could be added the equally realistic observation that water problems are sure to develop unless someone

takes responsibility for what happens to the rain after it reaches the ground.

Winfield Mercer, superintendent of water for the city of Jackson,

Ohio, has taken on that responsibility for 1,450 acres of tired farmland that sheds its water into Jackson's relatively new city reservoir, and he hopes to keep water problems under control for the sake of the land and his many water customers.

City officials recall with pride when their municipal water plant and reservoir was dedicated. The \$1.5 million project had been carefully planned by consulting engineers. They had designed the billion-gallon, 210-acre lake to handle all the water that runs off the Hammertown Lake watershed. The lake in turn had plenty of storage to run the filtration plant at its capacity of 2 million gallons a day—more than four times the need for Jackson's population of 8,000.



Jackson water plant with 2 million-gallon daily capacity.

The author is soil conservationist, Soil Conservation Service, Jackson, Ohio.

"This is a far cry from the city's earlier water supply," Mercer pointed out in reviewing the project's development. "We got our water from a series of 53 shallow wells in a valley 3 miles southeast of the city. They ranged from a depth of 35 to 140 feet. However, the rock and sand formation of the ground couldn't provide enough water for current needs. We had no hope of meeting future demands for industrial and residential expansion. Drilling deeper wells wasn't practical, because of salt water conditions at lower levels."

But the city still had problems even with its new water set-up. The water feeding into the reservoir was muddy and polluted with soil from eroding crop fields. Mercer encouraged city officials to buy the entire watershed area so they could attack the problems that plagued them. This was a novel idea in Ohio, as cities with reservoirs seldom acquire land much beyond the shorelines.

The next step was to find qualified help for dealing with soil and water problems in the watershed. After talking with Clyde Heazlet,

State farm forester, Mercer decided to ask the Jackson Soil and Water Conservation District to support a conservation program for the watershed and to furnish technical help.

The conservation job was started by liming and fertilizing the area near the reservoir shoreline and seeding it to bluegrass. Nearly 79,000 pine trees now give the old crop fields a green polkadot pattern. They were planted by a tree planter purchased by the city. The conservation plan calls for 75,000 more to be planted in the near future.

To put each acre to its best use, Mercer is also developing a recreation and wildlife program. An archery range has been laid out near the southeastern edge of the watershed. Roads have been built and areas cleared for picnicking and fishing. At the present time there are 15 picnic tables and cooking places, with plans to enlarge these facilities as needed.

The lake was first stocked with 40,000 bass supplied by the State Fish Hatchery. The demand for good fishing has increased at such a rapid rate that the City Water



Water Department employees planting pine on reservoir watershed.

Service Commission has entered into an agreement with the State Division of Wildlife to manage the lake, and the Division has added pike to the stocked fish.

Many people say that as the small, family-sized farms are decreasing in southeastern Ohio, the wildlife population also is declining. Small fields of grain and clovers that used to supply food have disappeared. Using a soils map and technical assistance furnished by the Soil Conservation Service, Mercer plans to develop small-grain and meadow strips on the contour. This land treatment will encourage cottontail rabbits and bobwhite quail to live in the area.

"We're proud of our water supply and filtration plant, which is considered one of the best and most efficiently operated installations in the country," said Mercer. "The conservation practices we applied on its watershed area are good insurance that the reservoir will be long lived. It will give us lots of good quality water for years to come. And by developing the recreational potential, we are not only getting the fullest and best use for each acre of land, but likewise the fullest and best use for each gallon of water."



Soil map which serves as guide for proper land use is discussed by Winfield Mercer (l.) and author.

The lifetime quota of water usage for the average person in the U. S. is 3,500,000 gallons.

Utah Irrigators Lick Water Losses

By Don L. Braithwaite

CONCRETE was the answer to the long-standing flooding and water waste problems of Utah irrigation farmers in two canal companies north of Panguitch.

The farmers, under the McEwen Canal and the Barton, Tebbs, LeFevre Canal, divert water out of the Sevier River. The diversion on the McEwen Canal side formerly consisted of logs, rocks, car bodies, and manure. On the Barton, Tebbs, LeFevre side, the diversion was a dirt dam.

July and August are the months when thunderstorms occur in this area, and high water is common during this important cropping period. The old diversion had been known to wash out several times in one irrigation season. The time required to get the water back into the canals ranged from 1 day to a week. Crop yields were adversely affected nearly every year and some years were reduced severely.

The Barton, Tebbs, LeFevre Canal also had a bad moss problem which greatly inhibited the water-flow. Lowell Henrie, for example, whose farm is on the lower end of the canal, reported getting the benefit of only about one-half of his stream when the moss problem was at its peak.

In 1959, the two canal companies decided to build a new concrete diversion and put in $\frac{1}{2}$ mile of concrete lining in the BTL Canal. The Soil Conservation Service, assisting the Upper Sevier Soil Conservation District, furnished technical services to prepare plans and specifications for the diversion dam. The Agricultural Stabilization and Conservation Service set up about \$14,000 to help on the project, and the Utah Water and Power Board financed the local cost with an interest-free loan.

The irrigation dam was completed and water was turned into



Construction of new channel and diversion dam at site of old log dam.

the canals in June 1961. The diversion has now withstood several large floods and many small ones.

"In the past," said James LeFevre, "when we had floods going down the river, we were out of water in both canals for as long as 2 weeks. Since this work was done, we haven't been out of water 1 hour. The moss has not interfered with the flow of our water as it always did before, and I have realized a much better stream under the BTL Canal. I feel that we made a good move when we constructed the diversion dam."

President Grant Houston of the BTL Canal observed:

"I am well pleased with the investment. The amount of water saved more than satisfies the costs."

The canals are diverted from each side of the diversion. By each outlet is a radial sluice gate. When the river is high, sluicing operations can be carried on without interfering with the stream size in either canal. In addition to the reduction in moss, the amount of silt accumulating in the canals and on the croplands is much less.

The diversion cost about \$27,000, and the canal lining, with about 411 feet of drain, cost \$9,197.

The diversion has a crest width of 60 feet and required 214 cubic yards of reinforced concrete.



Barton-Tebbs-LeFevre Canal after ditch was concrete lined.

The author is work unit conservationist, Soil Conservation Service, Panguitch, Utah.

Georgia Towns Rea

By Jame



Frank Green (l.), farmer, and Harold Smith, filling station operator, led successful drive to collect \$22,500 for watershed project.

SEVERAL towns are among the urban and rural interests that already are reaping major benefits from Georgia's Little Tallapoosa River watershed in Carroll and Haralson counties.

Towns that once were resigned to regular water shortages now can count on an ample reserve of water for months to come. The new water supply is also attracting industries that are creating new jobs and will contribute heavily to the economy of the area. Carroll County has 75 industries, with employees ranging from 6 to 800 people.

Lakes spreading out in the watershed are being developed into recreational centers. The project will save an estimated \$82,000 annually in flood damages, or 87 percent of the previous losses. Swamped-out land is being restored to pasture, vegetable, and other crops. Stream channels once clogged with silt are now clear. County roads that flooded with every heavy rain now carry increased traffic during rainy and dry seasons; and gullied roadsides have been graded and planted to grass, stopping erosion and beautifying the highways.

In March 1961, 17 bridges on Carroll County roads were heavily damaged by floods caused by heavy rains.

"It rained so much the blacktop

floated off the roads," said J. C. Daniel, Carroll County Commissioner of Roads and Revenue. "The following December we had rains that were just as heavy, but, because of the dams that had been completed in the watershed, not a bridge was lost in the watershed area of the county."

There are six towns in or near the watershed: Carrollton, Villa Rica, Temple, Bowden, Bremen, and Mt. Zion.

Since the project was started in 1956, 11 flood-detention dams have been completed, 2 others are under construction, and the 14th and final structure is expected to be finished this year. The entire project is scheduled to be completed in 1965. It includes 32 miles of channel improvement, 714 acres of gully control, 40 miles of roadside erosion control, conservation on the farms, and forest fire prevention.

Sponsors of the project are the

Carroll County government, the West Georgia Soil and Water Conservation District, and the towns of Carrollton, Temple, and Villa Rica. The Soil Conservation Service provides technical and cost-sharing assistance through the Watershed Protection and Flood Prevention Act.

Watershed reservoirs will supply 807 million gallons of water for Carrollton, Villa Rica, and Temple alone, with estimated combined annual benefits of \$13,200. The three towns, which have a combined population of 14,000 people, and Carroll County are covered by an overall economic development plan as part of the U. S. Department of Agriculture's Rural Areas Development program.

Meanwhile, Bowden and Bremen have joined with Carrollton and the West Georgia district to petition for an expansion of the Little Tallapoosa project to include 139,-



Flood detention lake built in Little Tallapoosa River watershed to reduce silting in Lake Carroll, 2 miles downstream.

The author is work unit conservationist, Soil Conservation Service, Carrollton, Ga.

Watershed Benefits

uite, Jr.

000 acres in addition to the 62,516 acres now in the watershed. More water is needed to meet the needs of growing population, expanding industry, and farm progress.

A water-supply storage of more than 23 million gallons cost the town of Temple only \$4,363. Villa Rica is spending \$22,500 to have another reservoir enlarged to provide 148 million gallons of water storage. The town will pay for a pumping station and pipelines. Landowners gave the land.

The city of Carrollton built 176-acre Lake Carroll back in 1948, with technical help from SCS, as a municipal reserve water-supply reservoir; but siltation kept the reservoir's waters muddy and began filling the lake at an accelerated rate. A watershed flood-detention reservoir built above Lake Carroll and land treatment measures have reduced today's siltation rate in Lake Carroll by 50 percent.

The Little Tallapoosa plan was amended in 1962 to include 636 million gallons of water in the watershed's biggest structure, to enable Carrollton to meet its needs for rapid industrial growth. For this supply the city will bear an estimated \$197,500 of the cost, and the estimated Federal cost for this reservoir's flood-prevention benefits is \$167,000.

Hundreds of persons, both local and from distant points, have already been enjoying fishing and boating on the lakes of the watershed project. Many thousands more are expected to take advantage of the recreational facilities offered by these lakes every summer. The lakes are all open to the public. Visitors have only to contact the owners, none of whom charge more than a dollar a person a day.

Mayor Olin Johnson, explaining that Temple previously got its water from a creek but that when



Channel improvement like this on Little Tallapoosa River totals 32 miles in watershed project.

the creek ran low its supply was threatened, said of the town's new watershed lake:

"We now have a 6 months' supply of water, even if it doesn't rain."

Similarly, Villa Rica obtained water from a small reservoir fed by a creek, and when the stream ran low there was no reserve. The watershed project included a flood-detention reservoir near Villa Rica. The town needed to raise \$22,500 to pay the cost of increasing the reservoir to include water-supply storage, but its funds were tied up by litigation resulting from a gas explosion in 1957.

Only 4 days before the deadline, Frank Green, a cooperator with the soil conservation district and a member of the Little Tallapoosa River Watershed Association, and Harold Smith, operator of a service station, organized the Villa Rica Development Association and canvassed the town. Green, Smith, and five others put up \$1,000 each. Other citizens responded, and in 4 days the \$22,500 was raised.

As Commissioner Daniel puts it, the project has brought individuals and groups closer together in the watershed—"folks in the towns and rural areas, businessmen and civic leaders, representatives of county and municipal governments. We are all benefiting from the project—it's a vital link in the chain of progress in the area."



This flood-detention lake provides 23 million-gallon water supply for town of Temple.

Study Downstream Effects of Upstream Watershed Improvements

By M. A. Hartman and W. O. Ree

THE Washita River in central Oklahoma has a long record of frequent and damaging floods. Losses in this agriculturally important valley were so great, in fact, that the Washita was one of the 11 major river watersheds for which flood-prevention operations were authorized by the Flood Control Act of 1944.

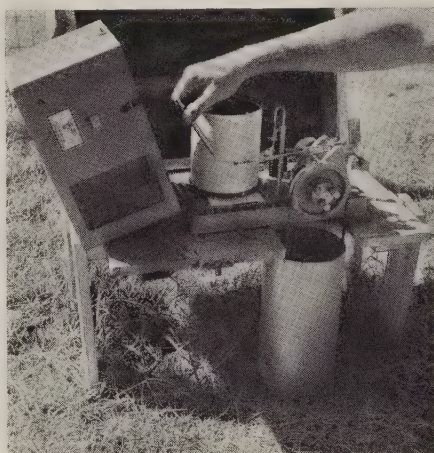
Since 1946, the local landowners, soil conservation districts, and the Soil Conservation Service have been vigorously applying a planned program of land treatments and structural measures for watershed protection and flood prevention in the tributaries of the Washita. This comprehensive effort is still under way.

The major effects of the program on the tributaries are reasonably well understood, but not so well understood are the effects that treatment on the tributaries will have on the mainstem flows and channels. When Congress appropriated funds in 1961 to establish watershed research in the Southern Plains, it accordingly seemed only natural to choose these mainstem effects as its central objective. An untreated segment of the Washita watershed between Anadarko and Alex, Okla., was chosen for this needed study.

Specifically, the main purposes of this research project are to determine how upstream conservation and water-control measures affect: (1) Mainstem floods, (2) total annual flow of the river, (3) sediment flow, and (4) the stability of the river channel. Effects on reservoir

silting and ground-water levels will also be investigated.

The Anadarko-Alex study reach includes 78 river miles of the Washita and the 1,128 square miles of watershed area directly tributary to it. The study area lies principally within the Reddish Prairies



Automatic recorders installed on water wells provide continuous graph of water-table elevation.

problem area in soil conservation, but contains some Cross Timbers. Alluvial soils constitute about 18 percent of the total land area in the study reach.

Although none of the tributary watersheds in the study reach has yet been treated under the flood-prevention program, some conservation practices have been applied to some of these lands. It is expected that watershed treatment, for which planning already has been authorized or completed on some tributaries, will extend into the area within the near future, thus providing an opportunity to observe conditions both before and after treatment.

A basic hydrologic problem is to

account for all precipitation that falls on the study area. A complicating factor is the time required for a raindrop to travel from the point it strikes the soil to the point where it may again be observed. This travel time depends on the distance moved, the route taken (which might be by surface or subsurface or a combination), and on the forces moving the raindrop on its way and those resisting its movement. Only when the role of each channel, reservoir, or aquifer providing the pathway for the raindrop is known will the effect of land treatment and water storage on the flow regime of the river be completely understood.

The data will lead to a disclosure of the laws of hydraulics determining the movement of water through channels and aquifers of the watershed. When this understanding is achieved, it will be possible to apply results of the Washita River study to predict the influence of upstream flood-control measures in other river basins.

The precipitation supply must be characterized by amounts, rates, and distribution. A network of 175 recording rain gages has been installed on a 3-mile grid within the 1,128-square-mile area. The rainfall data will be correlated with radar information, in cooperation with the U. S. Weather Bureau activities on meteorological radar re-

No. 70

This is the seventieth of a series of articles to appear from time to time in explanation of the various phases of research being conducted by the Department of Agriculture on problems of soil and water conservation.

The authors are, respectively, research hydraulic engineer, Chickasha, Okla., and investigations leader, Stillwater, Okla., both of the Agricultural Research Service.



This Washita River area is being surveyed periodically to determine rate of bank erosion.

search.

Small watersheds will be selected within the study area for more intensive investigation. These field-size units, representing a sampling of the soil associations and land-use conditions, will provide information on the hydrologic performance of the significant runoff source areas in the uplands and on the flood plains of the Anadarko-Alex reach. These data will provide a basis for interpreting the significance of changes in land-use and management practices upon rainfall-runoff relationships. They also will be an important link in establishing the connection between the hydrology of upstream and downstream areas.

Streamflow in the study reach will be measured at 5 stations on the main river, including both the entrance to and exit from the study reach. The 10 tributaries entering the river within this length will also be gaged. Surface flows and subsurface flows in the valley alluviums and changes in soil moisture and ground-water storage will be measured to determine total water yield.

Development of a better knowledge of the relationship of main-stem sediment yields to climatic factors and the use and treatment

of watershed lands is another of the major interests of this research program. The processes of reservoir silting also will be investigated. One or more floodwater-retarding structures will be selected for detailed studies of trap-efficiency, distribution and density of deposited sediment, delta development, and degradation or other channel adjustments downstream from the reservoir.

Observation and study of changes in stability or equilibrium of the Washita River channel in association with application of the watershed treatment measures is another primary area of interest. In this aspect of the study, it will be necessary to differentiate between: (1) Natural processes already under way or likely to develop; (2) any induced changes related to regulated flows released from the large water storage reservoirs upstream; and (3) any induced changes related to changed flow regime attributable to the watershed treatment program. Reconstruction of this history of the channel will help to make the differentiation.

The extent of installation of land-treatment measures and water-control structures in the study area is being charted and a complete land-use inventory maintained.

The effect of land use and structures development on the hydrology, sedimentology, and channel stability of the river will be determined by charting trends and defining relationships. A detailed study of the flow regime for an earlier 10-year period will provide a base for comparison.



Washita Flood Prevention Council representatives study one of 175 recording rain gages.

Irrigated Land Leveling

Saves Water and Labor

By Wayne D. Wavrin

CONSISTENT savings in irrigation water and labor and better crops are reported by farmers who have leveled their land in the Lower Yellowstone Irrigation Project in North Dakota.

Land leveling has increased 280 percent on the more than 50-year-old project in 5 years. More and more farmers have found that fields which were considered good enough a few years ago are water wasters and labor robbers. Farmers along the Missouri, Heart, Cannonball, and other rivers also are leveling their land for more efficient use of their irrigation water, as are those using underground sources.

An informal survey of 15 Lower Yellowstone irrigators showed that for 12 farmers growing sugar beets and beans, the water saving was at least 300 acre-feet on 307 acres during a single growing season. After their fields were leveled, the average amount of water applied in



Siphon tubes give maximum efficiency in water use on Henry Bauman farm in Lower Yellowstone SCD.

each irrigation dropped from 9 to 4 inches. There was no more drowning in the low places or lack of moisture on the high spots, resulting in more uniform yields and better quality crops.

Labor requirements, meanwhile, dropped from 8 to less than 2 hours

an acre for each irrigation. This saving alone went far toward paying for the land-leveling costs, which averaged \$54 an acre.

Production efficiency also was better for alfalfa and small grains. Where leveling and border dike systems replaced conventional ditch methods, the water and labor savings were appreciable. Before leveling, an average of 8 inches of water was applied in each irrigation—after leveling only about 4 inches. The actual labor time dropped from 3 hours to 1½ hour to the acre. Irrigation runs were longer; there was less ditch to use and maintain; distribution of water was better; and better yields resulted.

"I use only half the water now and got a 40 percent increase in beet yield," Robert Flynn, a district cooperater, reported. "I've got 2 acres more land, too, because good land leveling has eliminated most field ditches."



Land leveling was needed for proper drainage and management of irrigation water on this field in same area.

The author is State conservation engineer, Soil Conservation Service, Bismarck, N. Dak.

"The most significant changes after leveling were a reduction in man-hours needed to irrigate and a 40 percent increase in production," Andy Cayko said. "Under the new arrangement, I can do the cultivating, haying, and other seasonal tasks and still manage the water by myself. With the use of siphon tubes and better designed head ditches, I can change sets in 15 to 20 minutes. I can irrigate 15

to 20 acres in a day and not spend more than 2 to 2½ hours doing it."

Such experiences are representative among cooperators of the Lower Yellowstone district. The district supervisors and assisting Soil Conservation Service technicians for their part realize the need and importance of improved water application, and have geared their operations to it.

The farmers are unanimous in

recommending that all land leveling must be preceded by an engineering survey on which the cuts and fills are based. Proper water management, with precise land grading, is needed to provide high irrigation efficiencies. Most of them also agree that some adjustments in size of irrigation streams, time of irrigation, and length of runs will add even more to the saving of labor and water.

Waterfowl Marsh Developments

Catch on in Connecticut

By Edwin A. Swenson, Jr.

THE idea of marshland development for waterfowl has become contagious in Litchfield County in Connecticut.

This area presents an inviting mixture of dairy farms and country residences situated in a rolling, glaciated countryside. More than 60 percent of the county is in second-growth timber, much of it on poorly drained soils. Much of the seasonally wet acreage once was kept open by mowing and mid-season grazing; but with changing land use and farm mechanization, these wet fields reverted to dense stands of low quality hardwoods.

At about the turn of the century, when farmland was being abandoned, the far-sighted White family began buying up land near 750-acre Bantam Lake. Extensive natural marshes and swamps were included within the more than 4,000 acres eventually acquired. Today, the White Memorial Foundation manages these lands as a trust to keep them in a natural state. A program of woodland management, nature education, outdoor recreation, and wildlife man-

agement is administered by a trained staff.

The White Foundation early recognized the problems of maintaining the wetlands as a productive habitat for waterfowl. The Connecticut State Board of Fisheries and Game helped it develop a plan to keep the reverting marsh and swampland suitable for waterfowl. Basically the plan is simple: pre-

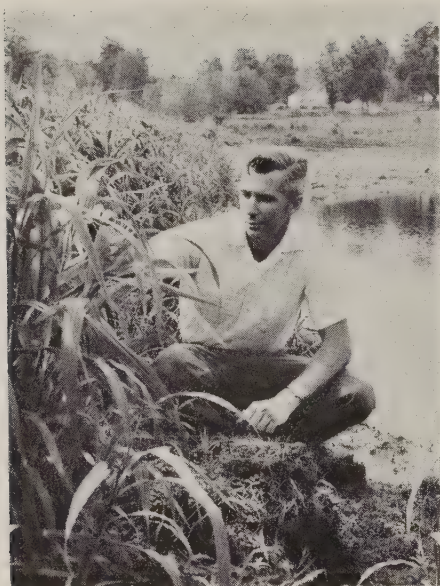
vent the invasion of hardwood trees and produce quality annual foods by managing water levels. Through the Litchfield County Soil Conservation District, the Soil Conservation Service provided engineering help in designing and installing needed water-control structures.

The success of the White Memorial Foundation program soon was evident to the nearby landowners.



Millett planted after water in Manfred Young wildlife marsh was drawn down in the spring.

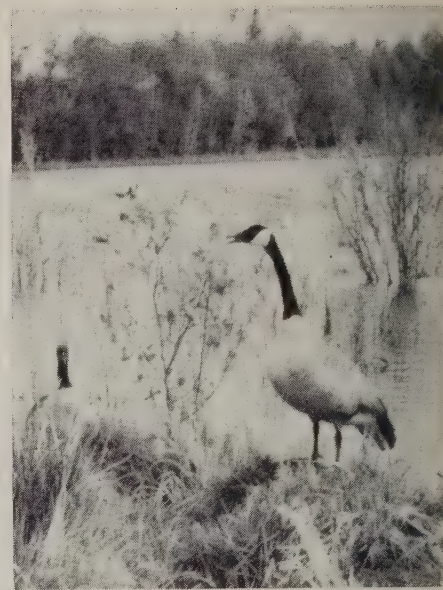
The author is work unit conservationist, Soil Conservation Service, Newton, Conn.



Japanese millet on Sam Swendsen farm.



Bird watching in marsh habitat provides recreation for many people.



Their reward may be a view of Canada geese like these protecting nest.

Flocks of Canada geese and various kinds of ducks became a local sight-seeing attraction. Waterfowl also began to be seen on ponds and swamps around the Bantam Lake area.

Meanwhile, a conservation program on the nearby dairy farm of District Supervisor Sam Swendsen included plans for developing a waterfowl marsh on a poorly drained portion of wooded pasture. The State Board of Fisheries and Game paid construction costs. The Swendsen marsh floods about 8 acres. Water levels are manipulated to allow seeding Japanese millet on exposed mud flats. The first year of flooding, during the fall of 1961, as many as 400 ducks used the marsh at one time; and the next spring the marsh provided waterfowl nesting sites.

Local interest really picked up after hunters and birdwatchers had seen the results on Swendsen's marsh. During 1962, the soil conservation district received many inquiries about building wildlife marshes, and the Litchfield County ACP approved cost-sharing for them.

The neighboring Lizauskas brothers often had hunted on Swendsen's land for released pheasant, but after a taste of duck hunting

on his new marsh, they decided there must be a spot on their own farm for a wildlife marsh. With Soil Conservation Service technical help, they located a suitable site, built a water-control structure, and developed a 2-acre marsh flooding back into a red maple swamp.

Miss Natalie Van Vleck, who raises sheep for breeding and exhibition, was another who watched the Swendsen marsh development with interest. A conservation plan worked out on her farm included converting a wooded swamp into an 18-acre wildlife marsh, by installing an earthen dam, with the State Board of Fisheries and Game agreeing to pay 20 percent of costs. Plans are to keep the marsh flooded for 2 years, until the trees are killed, and then to begin annual seedings of millet.

The upper end of the Van Vleck marsh borders on lands of the Regina Laudis Monastery, whose working nuns operate a truck crop and fruit farm. When they heard of the waterfowl developments next door, they also became interested in cooperating, by chemically killing the trees that border the marsh in a strip 80 feet back from the water's edge, and thus releasing the native sedges and low shrubs to provide nesting cover.

Just north of Swendsen's place, Rear Admiral Charles McVay, retired, owns a small Hereford beef farm. After visiting with Swendsen, he developed two waterfowl marshes, including a permanent pool for fishing on one site.

Wildlife biologists say wetland developments for waterfowl become most valuable when they form colonies of many sites around a large natural wetland. The success of the wildlife marshes on the White Memorial Foundation lands and the efforts of conservation agencies working with landowners have led to the start of just such a successful complex of waterfowl developments on private lands in Litchfield County.

Topics keyed to techniques of today's space age make up discussion fare for western water experts at the 31st annual meeting of the Western Snow Conference at Yosemite National Park April 17-19. The topics include the airborne radio-metric snow survey system, water runoff shifts and cloud seeding, instruments and telemetering, soil moisture and snowpack evaporation, highway snow removal, avalanche control, and human aptitudes in snow science.

Paper Mulch Helps

By William L. Smith

Grass Grow on Dams

A NEW paper mulch method of seeding grass on the slopes of floodwater dams is getting its third year's tryout in Texas small-watershed projects.

Soil Conservation Service technicians working with local watershed organizations still have not decided on general extension of this seeding technique and plan to sod or seed most dams in 1963 by conventional methods; but 1961 and 1962 results from the paper mulch were promising enough to warrant the Service's buying a special seeder in 1962 and trying the new method on an operational basis. Three trial seedings in the Trinity and Upper Washita watersheds showed "excellent" results at the end of the 1961 growing season.

In 1962, nine sites in the Trinity were seeded to common bermudagrass with the mulch, under irrigation, with "good to excellent" results; and two sites in the Upper Washita were seeded to native grasses without irrigation, likewise with good results.

The planned 1963 paper mulch

seedings total 250 acres (including 20 acres of "critical areas") in the Upper Washita, Middle Colorado, and Trinity watersheds.

The problem of getting a protective cover on new floodwater-retarding dams involves establishing thick and tight-rooted grass as quickly as possible. Grass cover gives earthfills and excavations the kind of protection nothing else can.

In trying the new mulch method, the SCS is working with one of the Nation's largest manufacturers of paper products, which developed the process. Tests also are being made in some small-watershed projects in the Eastern States.

The method makes use of a specially treated cellulose fiber processed from wood. The fiber, in a watery mixture with grass seed and fertilizer in suspension, is sprayed on the sloping earth, so the grass will germinate and root in the soil underneath the film of paper mulch. The mixture, with green dye, usually is sprayed at the rate of 1,000 pounds to the acre, dry weight. The green color

makes it easier for the operator to cover the surface evenly, much as one would paint a wall with spray equipment. Starch and resins are added, at the rate of 1 gallon to 400, to increase the erosion resistance of the cellulose and help to hold the seed in place.

The spraying equipment has a built-in agitation system and thoroughly mixes a slurry containing up to 40 pounds of fiber and 70 pounds of fertilizer for each 100 gallons of water in a 1,000-gallon tank. Hydraulic nozzles give even distribution up to 150 feet. One acre an hour can be mulched and seeded, meaning that more seeding can be done during the time of year which offers the best results, depending on how fast and uniformly the grass cover develops.

Check seedings in the Chambers Creek subwatershed of the Trinity near Corsicana showed that the cost of the paper-mulch planting was no more than that for sprig sodding.

The author is agronomist, Soil Conservation Service, Denton, Tex.



April 4—Paper mulch being sprayed on watershed dam.



July 13—Excellent stand of irrigated bermudagrass was obtained.



July 13—Only a sparse stand resulted on area seeded without paper mulch.

SNOW WATER

By R. A. Work

APRIL is a key month for irrigators and other water users in the West. This is the month when snow surveyors and other authorities on water supply put their heads together and come up with forecasts of the amounts of water that will be available in this vast area's streams and reservoirs for the ensuing water-using season.

The west-wide April-September snow runoff forecast is compiled by the Soil Conservation Service, which coordinates the information gathered by its own snow surveyors and those from other cooperating agencies, and published as of April 1. This widely distributed summarization of prospective streamflow for that period, and of reservoir storage on the first of April, is in addition to detailed monthly (January-May) snow survey reports issued for individual States.

Although the April report represents the key forecast in each snow

survey area, it is not always the last word. Heavy snowfall after April 1 well may improve short water prospects in a watershed, or even make it necessary to revise a "normal" water-supply forecast to one warning of prospective excessive runoff and consequent flood danger. By the same token, unpredictable rainfall not only may provide an early-season bonus in water supply but may bring flooding hazards by hastening the spring snowmelt, saturating watershed soils, and adding to the volume of water that streams are called upon to carry.

Ordinarily, however, the season's forthcoming water-supply pattern is more or less firmly set by April 1, because the major part of the snowpack has been laid down in major storms which customarily occur during the winter months of December through March. In fact, the water outlook reflected in ear-

lier snow surveys, especially those in early March, not infrequently coincide generally with the final spring forecasts. Some water users, such as sugar beet companies that have to plan planting acreages months in advance, find even the February or January reports on the water content of the mountain snowpack at that time to be of substantial guidance in setting up contracts with growers.

Together, the monthly snow survey figures more often than not spell out the season's water trend; that is, of short, normal, or above-normal water supply. This year, for example, the January and February snow surveys pointed generally to a below normal streamflow outlook, offset in part by normal or better reservoir storage, except in Arizona, where the water outlook was good. By March 1, the situation was improved by 10 percent along the continental divide from Denver to northern Montana, but declined 10 percent in Utah, Nevada, and southern Oregon, with other areas little changed.

Farmers in irrigation projects and soil conservation districts accordingly began in advance of the April forecast to plan recommended cropping adjustments. Included are the planting of more early-season crops, to take advantage of early runoff, and limiting their acreages of heavy water using, late-season crops.

The water forecasts have become increasingly dependable—to within 5 percent of complete accuracy in some instances—since the general snow survey program with Federal assistance started in 1936



Snow above the Snake River (center) along the Grand Teton range north of Jackson, Wyo.

The author is head, water supply forecasting unit, Soil Conservation Service, Portland, Oreg.

to replace previously isolated surveys in a few States. Each year's added snow water measurements at any of the approximately 1,500 snow survey courses increases the reliability of the course's measurement average and predictable variations.

At the same time, however, the SCS is continuing special efforts to improve further the accuracy of the snow measurements and the speed with which they can be made available to water users. Multiple-purpose reservoir operators, for example, depend heavily upon the water-inflow forecasts. They need to know at the earliest possible date whether to hold all the water available for irrigation, hydro-electric power, municipal and industrial water supply, or other use, or whether to lower the reservoir level and make room to hold back excess water for flood prevention.

For years, getting this information depended solely upon teams of snow surveyors' traveling on snowshoes or skis to oftentimes isolated marked courses established in major storm paths. Later, short-wave radio was drawn upon to speed the relaying of the field data to compilation headquarters; and over-the-snow machines were introduced to carry surveyors to distant courses.

Within the last decade or so, aircraft has been used to reach some more inaccessible locations, and for checking from the air midwinter snow depths measured on marked poles.

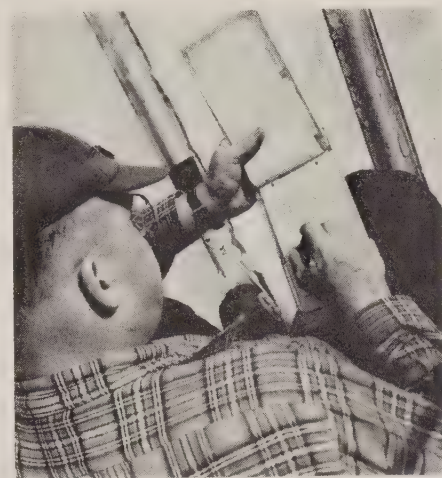
The Soil Conservation Service now is using automatic data processing equipment as a means of handling data and improving the accuracy of the forecasts. Further improvements are expected as more extensive data are obtained with automatic measuring and transmitting equipment.

To this end, attempts are being made to develop such devices that will measure snow water content, soil moisture, and perhaps other hydrologic data and transmit the data to a central location or to aircraft, probably by adaptation of currently available radio equipment. The problem of measurement of snow water content in such a way that data may be telemetered from isolated locations over a period of several months without attendance for the installation remains to be solved. Electronic devices have shown promise in trials.

This automatic equipment would make it practicable to put in snow courses in isolated areas where it is not now practicable to send men on foot, in oversnow machines, or

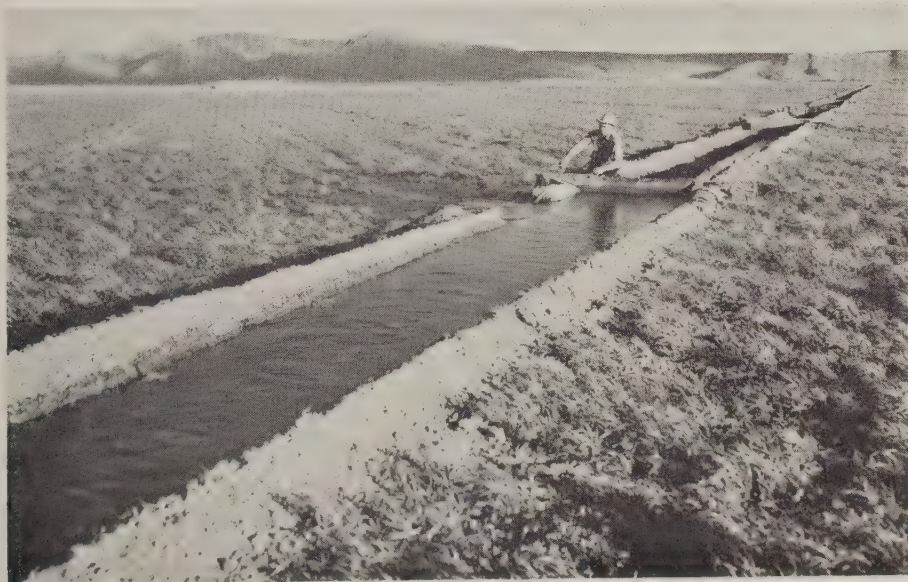


Space-age electronic devices hold promise of supplanting even aircraft and personal measurements on snow courses by sending the data in automatically.



even in helicopters, though many times they are the most desirable locations. In years of potential flooding, this automatic equipment would make possible a daily inventory of snow in the watershed.

Growing uses of water and competition for economically available supplies, in the West as elsewhere, are making it increasingly important—and urgent—to have available the best possible information at all times. Those concerned range from farmers and ranchers to municipalities, from industries to flood-control and forest fire-prevention authorities, and from inland navigation interests to the growing numbers of people who use the lakes and streams and snow-covered mountain slopes for recreation. Today's improved snow water forecasts serve them all.



Snow water brings life to irrigated lands of the West like these near Gannett, Idaho, in Blaine SCD.

Irrigators' Management

Key To Water Saving

By Tyler H. Quackenbush

WATER conservation is a subject of growing concern to communities everywhere alarmed by the rapidly growing demands on our water resources. Government and industry alike are studying ways of making water go further by making a given amount do more jobs or by reducing waste.

For example, the average per-capita use of municipal water increased from 95 gallons a day in 1900 to 148 gallons in 1955. Power, navigation, pollution control, and recreation are expanding and demanding their share of our limited water supplies.

One of the biggest opportunities for water savings is in a still increasing irrigation agriculture, where most of the supply already is used—85 percent of all the water consumed in the United States in 1960. In some western watersheds, as much as 90 percent of the streamflow is used for irrigation;

and in the East irrigation rapidly is becoming an accepted practice in modern agriculture. Nationwide, irrigated acreage expanded by 7.3 million acres from 1949 to 1959 to 33 million acres.

This expansion of irrigation can continue only as long as there is an adequate supply of water for all users. Increasing the level of efficiency in its use offers one of the most promising opportunities for meeting the growing demand for water in the future.

Many people believe that pipelines, lined ditches, land leveling, and sprinklers are the final answer to higher irrigation efficiencies. Although they all play a part, the real answer to good efficiencies lies in the ability of the farmer to use properly the tools at his disposal, whether it be a land-leveling job or a sprinkler system. Good irrigation water management, irrigating at the right time, putting on

the right amount, and putting it on at a rate the soil will absorb without excessive runoff or erosion are essential to get the results we want. To illustrate:

In 1950, the Soil Conservation Service started an organized program of irrigation water management in the Redlands-Highland Soil Conservation District in California. As no major changes were needed in the sprinkler irrigation equipment, the conservation program was aimed at showing the irrigators how to use their sprinklers, when to irrigate, and how much water to apply at each irrigation, based on soil analyses, water needs of the crop plants, and other factors.

On 513 farms of 10,072 irrigated acres, 161 acres had been underirrigated, 1,844 efficiently irrigated, and 8,067 overirrigated. As a result of changes made in the 10-year period 1950-59, the farmers used 50,220 acre-feet less water than they would have used under previous methods—and saved \$1 million in water and labor costs!

In 1960, with 202 farms and 4,720 acres under improved water management, 12,880 acre-feet of water was saved, at an average cost of \$17 an acre-foot, or an indicated saving of \$219,000 in 1 year. But even more important than the monetary savings is the fact that pumping from the basin was reduced, thus insuring a more dependable supply of water during the dry season. Yield, size, and quality of fruit were as good or better after the reduction in water use, and there was less root rot and less



Sprinkler irrigation, properly operated, is economical of water.

The author is irrigation engineer, Engineering Division, Soil Conservation Service, Washington, D. C.



Siphons give irrigator good control over amount of water applied to his crops.



Checking how fast soil absorbs water (intake rate), which determines most efficient irrigation methods to use.

leaching of fertilizer from the soil.

Good irrigation water management is a concept or philosophy that depends upon the desire of the individual irrigator to practice it. Often demonstrated reasons for him to practice such good water management include the fact that better management of the water on the farm usually will (1) reduce the amount of water required, (2) increase yields and improve quality, and (3) reduce labor require-

ments.

Likewise essential to improving irrigation water management is the irrigator's access to information concerning such seemingly simple items as "when to irrigate and how much water to apply at each irrigation." The solution to these problems requires a knowledge of plants' rooting habits, the water-holding capacity of the soil, and the rate at which the plants use water.

A good irrigator must be a combination soil scientist, agronomist, and engineer. Efficient water management is not a simple job; it takes effort and "know-how." Sprinkler systems, land-leveling jobs, lined ditches, and pipelines are all among modern tools available for getting good irrigation efficiencies; but without the proper handling of the water on the land itself, a completely effective job cannot be done.

Bentonite Pond Lining Solves Water Problem

By Jack Wiese

RANCHER Adam Lungren of Washakie County in Wyoming has found bentonite lining to be a satisfactory answer to the problem of leaky and undependable stockwater ponds and is benefiting by better grazing distribution and grass improvement as a result.

A pond on his Upper Nowood ranch 25 miles south of Tensleep was the only source of water for one large pasture. It would fill every spring, but by early summer, when water is badly needed, the



Lungren's bentonite-sealed stockwater pond.

The author is work unit conservationist, Soil Conservation Service, Tensleep, Wyo.

If your address changes, please notify us of your complete new address, including zone or RFD number, and include old address with our code number as shown above.

pond would be bone dry. Because this pasture thus could be grazed only in early spring when water was available, good grazing management was almost impossible.

Soil Conservation Service technicians working with the Nowood Soil and Water Conservation District suggested enlarging the old dam and lining the pond with bentonite to prevent seepage. The "mixed blanket" process was used to apply refined bentonite evenly at a rate of 2 pounds to the square foot over the 12,500 square feet of reservoir area, disking to mix the sealing material with the soil, and then packing it.

The pond area was fenced to keep livestock from breaking the seal. A 1-inch diameter pipe was installed through the dam to a home-built tank equipped with an automatic float valve that maintains a constant water level, and with a plank float to prevent trash or silt from clogging the pipe.

The project cost approximately \$750, part of which was financed through the ACP cost-sharing program.

The pond filled to capacity from spring runoff in both 1961 and 1962, and still contained a good supply of clear water in late September. The new source of dependable water has made it possible for Lungren to utilize formerly ungrazed areas and is contributing to proper grazing over the entire ranch. As a result, many areas al-

ready are showing improvement in range condition; and he has revised his ranch conservation plan to include three more lined stock ponds.

Lungren's water-conservation improvements also are a step toward stabilizing the watershed of the Nowood River. Floods in the spring of 1962 were so severe that this watershed was classified as an emergency flood area by the Agricultural Stabilization and Conservation Service, and was allocated some \$30,000 in extra funds for conservation practices to offset flood damages.



ALLUVIAL EMPIRE. Vol. 1.
By Robert W. Harrison, Delta
Fund in cooperation with Eco-
nomic Research Service, USDA.
Pioneer Press. Little Rock, Ark.
1961. \$8.50.

This 344-page volume deals with man's battle to reclaim and protect the 30-odd-million acres lying in the Mississippi Delta—a battle going on for some 200 years.

A listing of the chapter headings gives a preview of the comprehensive scope and detail of this volume.

They range from Chapter I—The Lower Mississippi River to Chapter VI—Land Forming for Drainage and Irrigation in the Mississippi Alluvial Valley.

What is not revealed in the chapter headings is the thoroughness with which the author unravels the history, magnitude, and persistence of man's efforts to conquer or, more correctly, to control, the Lower Mississippi. The author's description of the valley brings into sharp focus the relentlessness of the forces of Nature in shaping the river's—and man's—destiny. History, legal and organizational problems, and maneuvering over the centuries are brought alive and clearly reveal the difficulties involved in handling so vast an area by isolated and uncoordinated efforts.

An important aspect of this book is its attention to detail. Virtually all of the data come from original sources.

This is a must book for every land economist, legislator, agriculturalist, and flood control or drainage engineer.

The author brings into this work not only good and vivid writing, but expert knowledge of economics and geology, and a familiarity and feeling for the Alluvial Empire and its history that earmarks this as an outstanding contribution to the literature of man's efforts to work with Nature.

—FRED H. LARSON

MAY 1963

Soil Conservation



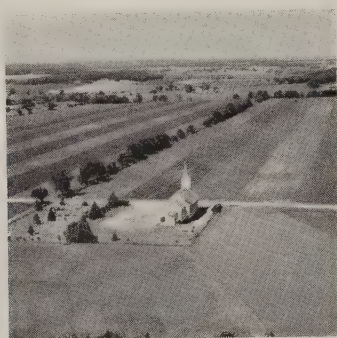


The Earth is the Lord's...

Soil Conservation 25 Years Ago

"It is now widely recognized that vegetation is the most important factor in controlling erosion. Man can maintain, restore, modify, or control the plant cover, but to accomplish this successfully he should thoroughly understand (1) the conditions which determine the appearance and maintenance of different plants and plant types (communities) in different places, and (2) the laws which govern their development and change under the various influences to which they are subjected or exposed. Man is constantly turning natural vegetation to his own uses, as when he cuts the forests for timber or uses the grass lands for grazing purposes. This he has usually done without adequate understanding of the conditions which govern the maintenance or regeneration of the kinds of vegetation he uses, and without sufficient intelligent foresight as to the consequences in the form of tremendous losses from erosion. . . .

"In most instances Nature has set about to repair these losses; man, in coming to her aid, can work with Nature more effectively if he understands her techniques."



COVER PICTURE—Soil Stewardship with a capital "S" is pictured in this view of the Wisconsin farms of LeRoy Christianson (at right) and Lloyd Jorgenson, on which contour and field strip-cropping form the backdrop for the Farmington Evangelical Lutheran Church near the town of Sheridan in Waupaca County, seen in the background.—Photo by E. W. Cole.

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Soil Conservation

ORVILLE L. FREEMAN
Secretary of Agriculture

DONALD A. WILLIAMS
Administrator, Soil Conservation Service

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FRANK B. HARPER, Editor

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Conservation Districts Watch Soil Stewardship Week Grow

By Marion S. Monk, Jr.

MODESTLY begun 17 years ago in several Southern States upon the inspiration of the publishers of *Farm and Ranch* magazine, Soil Stewardship Week has grown so remarkably that it is being observed by millions of people all over America May 19-26. As a symbol of man's sacred obligation under God to protect and wisely use His valued soil, water, and other related resources, the nationwide observance underscores the role that every citizen has in meeting the responsibilities of stewardship.

Soil Stewardship Week is an outgrowth of events which took place more than 15 centuries ago in the neighborhood of Vienne, France. In the year 470 A.D., bad weather and earthquakes caused crop failures, widespread hunger, and much human suffering. As a result, the Bishop of Vienne ordered prayer and penance on the 3 days preceding Ascension Day. The clergy and the people called upon God for help and deliverance from the calamities which beset them.

This custom of setting aside such special days—Rogation Days—soon spread from community to community and eventually throughout the world. Some 3 centuries after the supplication by the people of Vienne, the Church formally accepted the practice and instituted a special Rogation service each year before Ascension Thursday.



Pres. Marion S. Monk, Jr.

The magazine's publishers stimulated a renewed interest in the custom when they suggested to a number of Southern religious leaders that one Sunday each year be

Success of the nationwide soil and water conservation program during the last quarter of a century may be credited in substantial measure to its spontaneous support by many interests concerned with conservation of natural resources in the interest of community, State, and national welfare. Religious, educational, and commercial groups are among those which make significant contributions. The services of Soil Conservation Service technicians of many religious denominations are made available, primarily through local soil conservation districts and watershed organizations, to land and water users of all faiths. Included is pertinent information, which the Department of Agriculture is directed to provide as an essential part of its service to the public. This issue of SOIL CONSERVATION presents a representative cross-section of the conservation interest and work of religious groups and of individuals being observed May 19-26 in Soil Stewardship Week sponsored by the National Association of Soil and Water Conservation Districts.—Ed.

set aside to remind parishioners of man's obligations to his Creator as steward of the soil. Called Soil Stewardship Sunday, the observance captured the interest of ministers and laymen throughout the magazine's circulation area and soon spread far and wide.

In 1954, the originators of Soil Stewardship Sunday suggested to NACD, then the National Association of Soil Conservation Districts, that a still wider observance would aid in a nationwide awakening to man's soil stewardship responsibilities. The publishers offered to relinquish their limited sponsorship of the observance to the Association, which was pleased to accept the offer and since that time has assumed the major responsibility for encouraging the nationwide observance.

In 1956, the observance was extended to a full week. Churches of virtually all faiths joined in celebrating Soil Stewardship Week by placing emphasis on man's stewardship responsibilities. This month, 2,936 soil and water conservation districts in the fifty States, Puerto Rico, and the Virgin Islands are observing Soil Stewardship Week. The men and women of the districts, through their State and national associations and through the districts themselves, are sponsoring this event for the tenth consecutive year.

Working with the Association in this undertaking has been a Soil Stewardship Advisory Committee composed of leading churchmen in the Nation. Current committeemen are: the Rev. E. W.

Note:—The author is president, National Association of Soil and Water Conservation Districts, Batchelor, La.



Clerical members of Soil Stewardship Advisory Committee and laymen on NACD Soil Stewardship Committee at Association's 1963 convention (l. to r.): Rev. Lewis Newman, Rev. Henry A. McCanna, Rev. Harold Huff, Oscar Laper, Robert Ellis, Msgr. John George Weber, Raymond D. Shaffer, and Rev. E. W. Mueller.

Mueller, National Lutheran Council, Chicago; the Rev. John George Weber, National Catholic Rural Life Conference, Des Moines; the Rev. Harold Huff, Board of Missions, Methodist Church, Philadelphia; the Rev. Henry A. McCanna, National Council of the Churches of Christ, New York City; and the

Rev. Lewis Newman, Southern Baptist Convention, Atlanta.

The Association's Soil Stewardship Committee is headed by Oscar Laper, NACD's Upper Mississippi area vice president from Rock Springs, Wis. NACD's Northeastern area vice president, Raymond D. Shaffer of Dalmatia, Pa.,

and Robert Ellis, supervisor from Burlington, Ky., also serve on the NACD committee.

This year's observance has as its theme: "We Turn Our Eyes To The Future." Through this theme, the provocative challenges of the future—"to identify our national goals, to enhance the dignity of man, and to comprehend the unity of nature," through "... an awareness of growing needs, confidence in our neighbors, and faith in God"—are recognized.

As a means of encouraging widespread observance of Soil Stewardship Week, the Association creates and publishes a broad selection of materials, including booklets, church program blanks and inserts, posters, newspaper mats, and an illustrated 2-color booklet. Many churches find this publication helpful in reminding people of man's obligation to God in the use of His rich, natural gifts.

The necessity for responsible soil stewardship, utilizing the experiences of the past to build for the future, is brought out in the 1963 booklet:

"With each passing year, the pressures on our limited supply of resources are being compounded. More and more people each year put more and more of our resources to use. The demands increase for housing and highways, for food and fiber, for industrial and recreational space, and for all the other mounting needs of a growing society. Expansion and enlargement are bywords, and the end is not in sight. As good stewards, there is need to turn our eyes to the future, anticipating the requirements of tomorrow, in order that we may exercise intelligent guidance and pit wisdom against waste . . .

"We have emphasized for years that 'With the right to use, goes the duty to preserve.' Now, in the face of our burgeoning future, we must enlarge the maxim to recognize that with the duty to preserve goes the responsibility to plan.



The Olive Chapel Baptist Church at Apex is among the best rural churches in North Carolina—or the Nation.

“What is being done on conservation farms, in Soil and Water Conservation Districts, and in an increasing number of towns and cities must soon be expanded with deliberation to encompass whole counties, watersheds, States, and

river basins. There are goals to be set and goals to be met. The alternatives, clearly, are waste, exploitation, mis-use, and ultimate default on our children's heritage.”

Thus, the philosophy of good stewardship, recognizing that the

earth is the Lord's, needs to be expanded from the farms and towns to the more populous areas of the Nation. The assistance and support of clergymen in cities and suburbs can help extend the spirit of stewardship to all America.

Colorado Rancher Profits By Combining Business Methods and Soil Stewardship

By Robert K. Griffin



Hap Hudson and his “right hand.”

R. W. (HAP) HUDSON with his talk about grass and cattle yields and about costs and profits might give a first impression that he is one of the most exclusively business-minded ranchers you ever met.

But spend a few minutes with him and you are sure that, with all his hard-headed judgment in matters of production and expense, Hudson is a true steward of the soil—profoundly reverent in his regard for the land and thankful to the Creator for the circumstance which permits him to use and care for it with understanding.

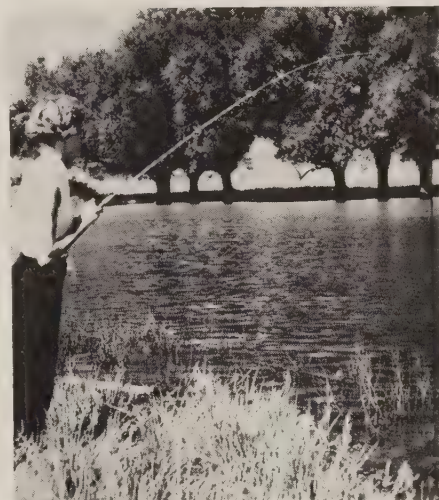
Hudson is a member of the Four Square Gospel Church at nearby Falcon, Colo. It follows almost without noting that Soil Stewardship Week gets befitting recognition each year by that congregation, with the supervisors of the Black Squirrel Soil Conservation District lending a hand with materials for the Sunday service. Hudson served as president of the district board for 2 years and is still a supervisor.

In the conservation use and treatment of his 4,200-acre spread, Hudson feels deeply an obligation to the generations of the future.

“The work I do now, in keeping this land I farm safe and productive, means to me I am using the soil in the way God intended,” he explains. “I am preserving it for those who follow.”

Hudson has known the ups and downs of farming. His younger years were spent on his father's ranch in Terry County, Tex. In the middle 1920's, the elder Hudson lost the ranch after contending with a sagging cattle market. He borrowed money to start cotton farming, and by 1931 things were looking better. That was the year Hap married Juanita Schultz, a local Texas girl.

“She's my right hand,” Hudson brags. “We have worked side by side on the land to make the good



Daughter Retha finds time to fish for bass in stock pond, even if her father doesn't.

life for our children. We feel amply rewarded for our efforts.”

On a trip to Colorado in the early 1940's, young Hudson was attracted by a combination farm and ranch near Eads. He bought the place and moved his family there. But he still wanted to get back to his first love—a complete ranching operation—and sold out, intending to return “home” to Texas. Then he saw the Falcon ranch that he now regards as home.

He decided on purebred Hereford cattle, and as the herd grew he added land. To make the place entirely a grass-and-cattle unit, he began seeding cropland to grass.

Note:—The author is work unit conservationist, Soil Conservation Service, Colorado Springs, Colo.

This paid off. In some years he harvests seed and, with a seed-cleaning machine he bought, processes it in spare time. He sold \$3,500 worth of seed one year but averages less than that most years.

Increased calf weights—up 50 to 75 pounds in 15 years to an average of about 450 pounds—are partly due, Hudson says, to his practice of leaving plenty of old grass. He watches his grass carefully and moves the cattle before they take more than they should according to the proper use principle.

The calves are recognized for their size and conformation, and for their ability to gain rapidly. Quite a few 4-H youngsters have learned about this and regularly buy Hudson calves to feed.

Hudson made use of the Great Plains Conservation Program, with accelerated technical help from the Soil Conservation Service, to help get the needed conservation work on the ranch done faster. To solve stockwater problems, he sank wells and installed permanent concrete tanks to insure ample water storage. In two locations, however, he uses stock ponds, and these he



Hudson and Larry Heil of the SCS in Pubescent wheatgrass making up part of 1,100 former cropland acres Hudson has seeded to grass.

stocked with fish. He has little time for fishing, but he hears “through the grapevine” this has not been a problem with the youngsters in the neighborhood.

Hudson has seeded 1,100 acres of former cropland to grass—mostly crested wheatgrass, intermediate wheatgrass, and brome. They are giving him a longer green-grass season. To keep high-

producing pastures, he breaks out some of his grass each year and reseeds after a year in grain, with sweetclover and alfalfa seeded in to improve the grass stands at the start.

“I can run a cow on 8 acres for 6 months,” he said. “The way things are today, land has to yield its best or it isn’t profitable. The answer usually isn’t more acres—it’s more production per acre.”

Woven into the answer, to Hap Hudson’s way of thinking, is the way in which land resources are used in conservation farming or ranching, and the understanding with which the conservation farmer gives it the care and treatment it needs for continuing service to mankind.

That is why, though he may be too busy to go fishing, he always finds time to attend the monthly soil conservation district board meeting.

“I firmly believe in conservation,” he says by way of hardly needed explanation. “That’s the reason I went into the Great Plains Conservation Program. I feel that the work I am doing will improve my land and preserve it for future generations.”



Registered Hereford bulls like this young fellow grow to show quality on Hudson’s grass before they are sold at the ranch.

Conservation Helps Churches and Schools

By Carl D. Boggs

CHURCHES and schools are lined up with farmers in every-day practice of soil stewardship in the Horry Soil Conservation District in South Carolina's coastal section.

During the past 4 years, for example, nine schools and four churches have installed conservation drainage measures with district help. This work involved the installation of 11,650 feet of 6-inch tile drains and the excavation of more than a mile of dragline ditches.

The topography is generally flat, and the land has a high water table. Although cemeteries, athletic fields, parking areas, and buildings accordingly are located where the soil has the best drainage, additional internal drainage often is

essential for their proper use. The drainage has greatly improved the beneficial use of these facilities, by lowering the water table and eliminating "boggy" conditions.

Meanwhile, each year between 800 and 900 farmers in the Horry district apply conservation measures on their lands. As these practices are established mostly in the fall, winter, and spring months, there is a slack season during the summer for both layout and installation of engineering measures. It is during this period, when the district farmers are busy with their tobacco crops and the district equipment is not in full use in applying conservation practices on their lands, that the schools and churches request assistance through the district. The time involved by



Horry County ministers on SCD-sponsored conservation tour watch district-owned trenching machine install drainage tile on Harry L. Davis farm.

Soil Conservation Service technicians working with the district for planning and layout of the drainage for churches and schools is negligible, because all of the areas are clear of underbrush, and the size of each job is small.

Many of the church members and school officials already are district cooperators and have used the services available to them through the district program. Others have become district cooperators as a result of working with these religious and educational groups.

For the past several years the district has promoted Soil Stewardship Sunday by sending the ministers in Horry copies of the soil stewardship booklet, the district annual report, and a personal letter from the district chairman. Most of the churches in Horry dedicate one Sunday each year to remind the members of men's obligation as stewards of the soil. As the Reverend George Lovell, pastor of the First Baptist Church in Conway, says: "Soil conservation is of vital interest to all our people, and I think that the effort to bring it to the attention of the people through the churches is most commendable."

The observance of Soil Steward-



Pastor William Mattox (l.) and SCS Engineer James E. Griffith make plans for tile draining Salem Baptist Church grounds.

Note:—The author is work unit conservationist, Soil Conservation Service, Conway, S.C.

ship Sunday and Farm-City Week and essay contests on conservation in the schools are all drawn upon to further conservation interest and action in the community. Results of

these activities are reflected in a better understanding by nonfarm people of the purpose of the district program. And farmers and nonfarmers alike, working through

their soil conservation district and their churches and schools, are solving problems benefiting each one individually and the community as a whole.

Missouri's Conservation Priest Is Man of Many Works—and Titles To Match

By Tarleton A. Jenkins and William C. Shotwell

THE spread of soil and water conservation farming in his own State of Missouri and beyond is closely identified with the pioneering preaching and practice of good soil stewardship by a still active 82-year-old Catholic priest who holds that "soil and soul conservation are inseparable."

He is the Rt. Rev. Msgr. George F. Hildner, city-born son of a Carlyle, Ill., blacksmith, who has spent nearly half a century bat-

tlng for more rewarding living for people of the two southeastern Missouri rural parishes he has served since completing his first 10-year assignment as an assistant pastor in St. Louis in 1915. Pastor of the St. John the Baptist parish in Gildehaus near Villa Ridge in Franklin County, to which he was assigned in the 1930's, he has earned along the way such titles as "fighting priest of Missouri," "Alfalfa George," "levee priest,"

"the priest who lifts mortgages," and "saviour of souls and soils."

"If you live long enough," Monsignor Hildner once remarked with becoming clerical humility, "you will get all kinds of titles."

Those who have worked with him in conservation and other undertakings for rural community development would not dismiss his nicknames so casually. Take the "levee priest" tab, for example: After his first rural parish at Claryville suffered its worst inundation in history in 1922 from flooding of the Mississippi River, the then Father Hildner was instrumental in getting Federal and local financing for a \$3,000,000 system of levees. All \$450,000 in bonds he led the local people in selling for their part of the levee financing were redeemed in full.

And in 1943 he was dubbed "Alfalfa George," because he organized an association through which to buy, at great savings to his local farmers, badly needed hay in that drought year. As early as 1916, he is credited with having led Perry County to organize a farmer cooperative, and he helped to obtain the first county agent in the southeastern Missouri area.

Monsignor Hildner's interest in



Home and on the job at St. John the Baptist Church in Gildehaus, Mo.

Note:—The authors are respectively field information specialist, Denver, Colo., and work unit conservationist, Washington, Mo., both of the Soil Conservation Service.

soil and water conservation as such similarly dates back to this modern farming movement's earliest days. It was his continuing work in the conservation cause that was to lead to his being honored by the National Association of Soil and Water Conservation Districts at its 17th annual meeting in 1963 with its first "Special Service Award":

"For being a pioneer for the cause of Soil Conservation Districts.

"For representing his State at the first annual meeting of the Association.

"For being known throughout America and loved and respected for his dedication to the concept of Conservation, Development, and Self-government—and for his untiring efforts and influence in reminding his fellow-man to be a good steward of the soil—a most precious God-given resource."

The Missouri prelate was active in getting an erosion control demonstration and a Civilian Conservation Corps soil conservation camp located in Franklin County. He built the first terraces in that section of the State on the slopes of the 33 acres of parish property, and established what is believed to have been the first church-sponsored conservation demonstration farm. He also helped to organize a 75,000-acre wildlife protective area in the county.

After helping to get the State Soil District Enabling Act enacted, the forward-looking priest was largely responsible for encouraging local landowners to organize one of the first two districts in Missouri—the Franklin County district formed in 1944—of which he was a supervisor for 7 years. He also helped to organize the Missouri Association of Soil Districts (now the Missouri Association of Soil and Water Conservation Districts), and served as its secretary-treasurer.

With the help of the Franklin County district, the direction of



Msgr. Hildner receives NACD Special Service Award from President Marion Monk at 1962 national meeting in Denver, Colo.

agriculture in Monsignor Hildner's parish changed, as the row-cropping system of generations gave way to one of grasslands and livestock, conservation cropping, and efficient use of all soil and water resources. Did it pay?

"There isn't a mortgage in the parish," he replied to that question. "Soil conservation was the greatest good ever to hit America. When the country was blowing away in the 1930's, God said, 'If you don't stop this thing, I'm going to blow the whole business off the map.'"

Monsignor Hildner's soil and water conservation interests fit into his philosophy that "a priest is a man who should live for his people" and take part in the civic affairs of his entire community, regardless of creed. As a star in semiprofessional baseball, he turned down a chance to become a professional ball player in favor of the religious vocation that was to take him into rural community service. In 1923, he helped to form the National Rural Life Conference, which later named him "America's Outstanding Rural Life Clergyman" and gave him its

Distinguished Service Award.

He has received numerous other church and State honors, including elevation to the monsignorite by Pope Pius XII in 1946; and is vicar forane, dean of the Franklin County deanery that includes a score of churches and monasteries.

Monsignor Hildner's newest resource conservation objective is the development of the Meramec River basin at St. Louis' back door. Conservation, flood prevention, and recreation are the goals. Cooperating in the project are a dozen Federal and State agencies and groups, including the Missouri governor's advisory board. A final plan soon will be ready for consideration by Congress.

The veteran agricultural priest's continuing labors in behalf of conservation of local, State, and national resources improvement thus are in character with his conclusion expressed to those who have heard him mention occasionally the possibilities of retiring: "It's a lot more fun to wear out than to rust out!"

The land shall be utterly emptied, and utterly spoiled: —*Isa 24:3.*

He Practices Conservation In "Partnership With God"

By Stephen L. Turner

THE Rev. William H. Stauffer preaches what he practices—soil and water conservation.

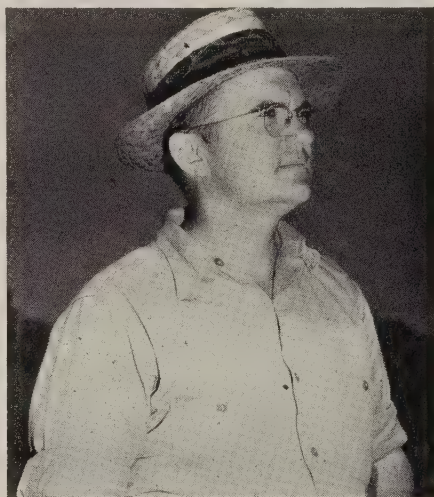
When this veteran Mennonite supply preacher takes off from his Tuscarawas County, Ohio, conservation farm on one of his frequent trips to some other part of the country, he may be going on his church's business as head of its mission committee—but he is just as likely to be headed for a soil conservation district meeting somewhere. On the Ohio Farmers' Institute speaking staff, he starts his speaking engagements in November and finishes in March, so as to be back in Ohio for the busy months on his 429-acre place on Route 1 near Stone Creek.

Reverend Stauffer's nearly 100 such conservation speaking appearances outside of his own State have included those at State and individual soil and water conservation district meetings from New York to Minnesota. They have included talks in Indiana, Missouri, and Illinois, in which State alone he has addressed 60 district annual meetings. He has spoken three times at the Ohio State Federation of Soil and Water Conservation Districts' annual meetings, and at meetings of virtually all the 80 districts in this State.

Ask Reverend Stauffer why he has such a deep interest in soil conservation work, and he will tell you it is "Because the earth is the Lord's."

He understandably is in demand

as a conservation platform headliner because he knows—from long experience—whereof he speaks. It was back in 1940 that he bought the first of three farms included in his present set-up. The second was



Rev. Stauffer in his working clothes.

bought in 1941 and the third, bringing their total acreage to 260 acres, was bought in 1944.

All of the farms were "worn out" and presented a real challenge to the conservation-minded farmer-pastor.

Looking back over the nearly a quarter of a century since he set out to make productive farms of the places he acquired, he says with obvious satisfaction in that achievement:

"I have taken this abandoned wornout land, and over a period of years have made it as productive as any land in Ohio. As a result of this amazing transformation, I have been traveling over the Midwest sharing with others the en-

thusiasm of going into a partnership with God in this great work of soil and water conservation."

It was for his own benefit as well as that of his neighbors that Reverend Stauffer took an active part in bringing about the organization in 1943 of the Tuscarawas Soil Conservation District, which he served as one of the five original supervisors. Much of the county's lands bore the scars of soil erosion from cultivation dating back to pre-frontier days when corn was grown there by Indians. Nearly a hundred "Christian Indians" in 1782 mistakenly paid with their lives in their fields at Gnadenhuetten for raids on the whites by other tribes. A monument to these victims of white wrath still stands there.

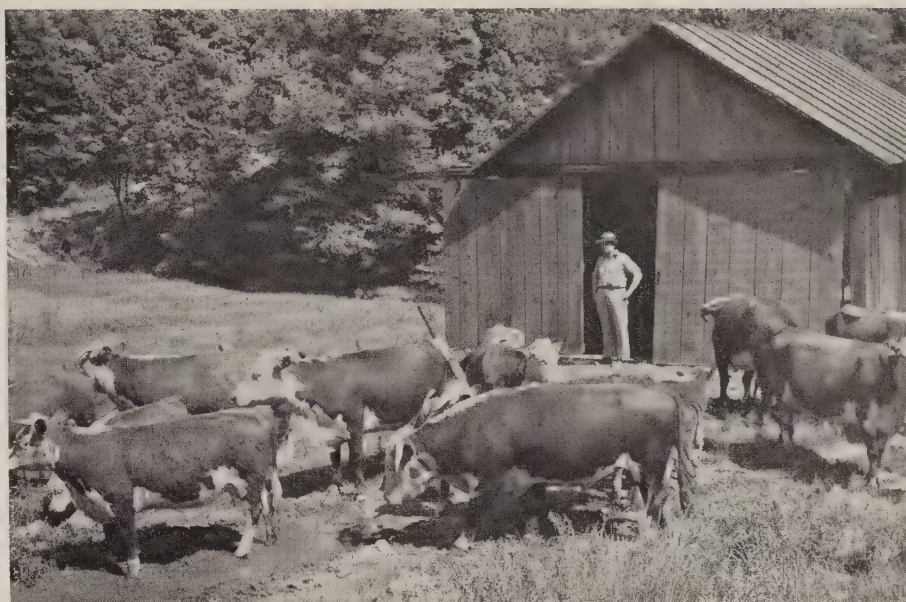
The original district program which Stauffer and his fellow supervisors worked out with the help of Soil Conservation Service technicians called for a wide range of conservation measures that farmers could use, as needed to bring about better land use and water management. Over the ensuing 20 years, some 800 Tuscarawas County landowners and operators have followed in the conservation footsteps of the Mennonite preacher and his early colleagues to become district cooperators, of whom about 725 are farming according to basic soil and water conservation plans.

The practices finding their way onto more and more of the county's farmlands range from conservation cropping systems and contour farming to pasture planting and improvement, from tree planting

Note:—The author is work unit conservationist, Soil Conservation Service, New Philadelphia, Ohio.

and woodland improvement to wildlife area treatment, and from diversions and stockwater developments to improved drainage on valley lands. The Stauffer farm itself is kept mostly in grass, with some corn grown for silage—on the contour. He buys and fattens about 500 feeder cattle and 1,000 hogs a year.

Meanwhile, the Tuscarawas district supervisors recently have updated their district program to bring it more in line with the urbanization, strip-mining erosion and stream pollution, and others of today's recognized broader rural area improvement and development problems and opportunities. Pointing out that "We are on the threshold of a new era in the management of our resources—of land and water, forest and wildlife—by our people," Secretary Orville L. Freeman commended their action in modernizing their memorandum of understanding through which the districts obtain Department of Agriculture technical and other assistance. He termed it "an important initial step in helping private landowners move forward more effectively with their soil and water conservation effort."



Some of the Stauffer Herefords that thrive on his good conservation pastures

Appropriately, the Stauffers' elder son, Bruce, a senior at Ohio State University, is majoring in farm management; and Bill, a 1962 high school graduate, is planning on special training in auto mechanics.

In the meantime, their father continues to practice soil and water conservation in today's new setting—and to preach what he practices for all to hear.

Quotes

Next to reading of the entire Bible itself nothing short of a painstaking study of a concordance would bring to light all of the numerous biblical references to man's dependence upon soil and water and his stewardship of those resources from the days of the prophets and the psalmist. One concordance, for example, contains nearly seven columns of references each to land and to water. For example:

And God called the dry land Earth: . . . —*Gen. 1:9, 10.*

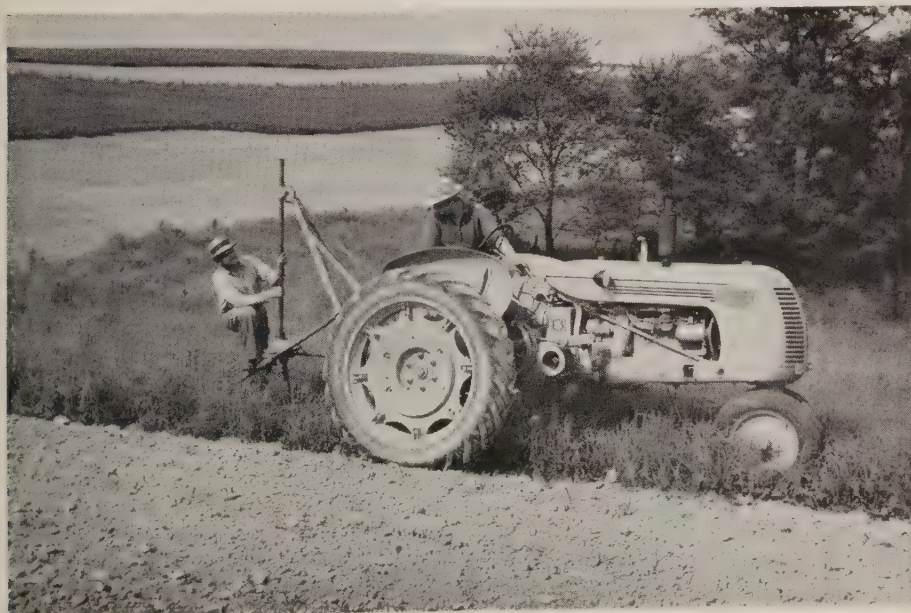
But I have said unto you, Ye shall inherit their land, and I will give it unto you to possess it, a land flowing with milk and honey. —*Le. 20-24.*

The earth is the Lord's and the fullness thereof:—*Psa. 24:1.*

Great is our Lord . . . who maketh the grass to grow upon the mountains. —*Psa. 147:5, 8.*

. . . he that ploweth should plow in hope; —*I Cor. 9:10.*

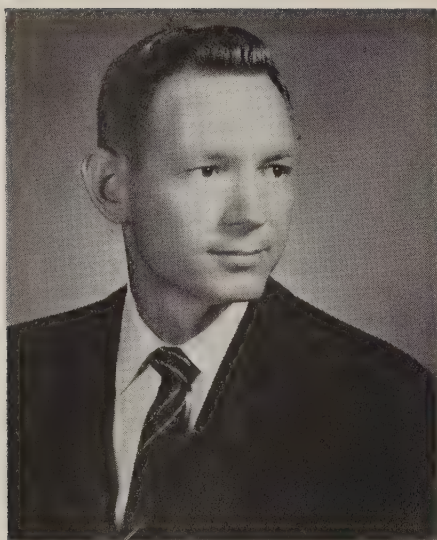
. . . those that wait upon the Lord, they shall inherit the earth . . . and their inheritance shall be forever. —*Psa. 37:9, 18.*



Rev. Stauffer drilling post holes with help of Doren Baah (on tractor) for contour fence between contoured cultivated fields and pasture.

Ministers Spread As Conservation

By W



Chaplain Ryan Seawright.



Chaplain Vernon Grimes.



Chaplain J. R. Whiddon.

GEOORGIA ministers are enlisted in an unusual program of furthering improvement of the State's natural resources by serving as chaplains of soil and water conservation districts. They especially are putting more meaning into the Empire State's soil stewardship movement.

Twenty-two of the 27 soil and water conservation districts that blanket the State arranged for chaplains in 1962 to do this important voluntary work. The district supervisors have been gratified with the results and expected to have active chaplains in all 27 districts by this year's Soil Stewardship Week, May 19-26.

Most of the chaplains in Georgia

are ministers of rural or semirural churches. Generally, they have had some agricultural background and have seemed to be glad of the opportunity to get back a little closer to the soil. At the same time, they find themselves promoting a program that is vital to their church members and to all of the residents of their communities.

The district chaplains uniformly report their soil stewardship work to be stimulating and challenging—that it is closely related to their primary mission, “soul stewardship.” As the Rev. Ryan Seawright, pastor of Blairsville Methodist Church and chaplain of the Blue Ridge Mountain district, put it: “The soil and water conservation district activities are a very important part of God's work.”

“I believe in more farming in



First Baptist Church, Reynolds, Ga., whose pastor, Rev. Whiddon, is chaplain of the Ocmulgee SWCD.

Stewardship Message

District Chaplains

S Allen

religion and more religion in farming," said the Rev. C. P. Watson, Towaliga County district chaplain.

Retired as a Baptist minister after 40 years, Reverend Watson also is a member of the State House of Representatives. Three other Georgia chaplains, one a former soil conservationist, actually own and operate small farms in addition to performing their ministerial duties.

Through the leadership of these soil and water conservation district chaplains, the soil stewardship program has found its place in the fast-growing suburban churches and even at the services of downtown congregations. The clerical conservation leaders continually remind one and all of a common interest—their dependence upon the soil.

The man who started the district chaplain program in Georgia is Dr. G. Ross Freeman, assistant dean and director of field education in the Candler School of Theology at Emory University in Atlanta, and chaplain of the Georgia Association of Soil and Water Conservation District Supervisors for 3 years. While addressing the State Association in December 1961, he foresaw a need for supervisors to get "more thought leaders," and especially "ministers committed to the gospel of conservation." He expressed his belief that "responsibility just might do this quicker than anything else."

Dr. Freeman, at that time completing his first year as State chaplain, pointed out that district chaplains could be "extraordinarily valuable in promoting Soil



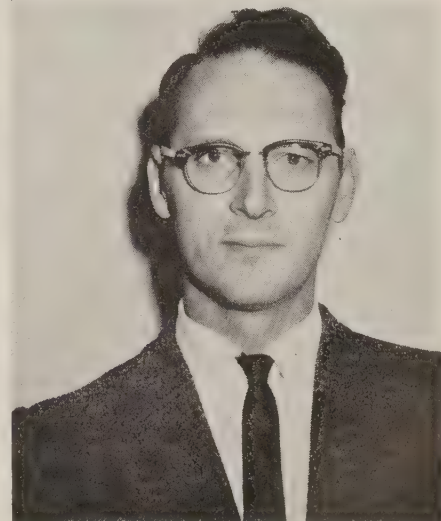
State Chaplain G. Ross Freeman.



Chaplain Emory Gilbert (r.).



Conservation pattern near Royston reflects good soil stewardship practiced for more than a quarter of a century in this and other Georgia areas.



Chaplain Olan Jones.

Stewardship Week observance." They have been that and more, Dr. Freeman says, pointing out that the ministers themselves also receive benefits while promoting the soil stewardship program. One of the most obvious, he believes, is being provided with a vocabulary of agricultural terms with which they can better communicate with their church members. The district supervisors at their 1962 annual meeting presented him with a plaque for "Outstanding Service" as State chaplain.

The district chaplains help plan and conduct ministers' conferences prior to Soil Stewardship Week and, of course, conduct appropriate services in their own churches. They distribute packets of materials on soil stewardship, which include, among other things, suggested ways in which ministers and churches can help advance soil and water conservation programs.

They also make radio and television announcements on soil stewardship, write articles for newspapers, send out letters to district supervisors and others, speak before civic and other groups on the Soil Stewardship Week theme, and

arrange tours so that other ministers and laymen can see conservation practices in action.

"It is a pleasure to be associated with the dedicated men of our area who are interested in conserving our natural resources for the present and future," said the Rev. Vernon Grimes, Upper Chattahoochee River district chaplain and pastor of Riverbend Baptist Church. "They believe these natural resources are a gift from God and we are to treat them as sacred and holy."

"I believe this chaplain's program greatly aids the Soil Conservation Service in bringing together more people of all vocations to cooperate in an honest effort to recognize and discharge our responsibilities as stewards of God's earth," said the Rev. Olan Jones, Oconee River district chaplain and pastor of Watkinsville Baptist Church.

The Rev. Emory C. Gilbert, Briar Creek district chaplain and pastor of Louisville Methodist Church, agrees with Dr. Freeman that "The Soil Stewardship Week program has been very helpful to me in my church work, especially

when I have the opportunity to talk about preserving that which we have."

The Rev. Curtis Tillman of the Lenox-Antioch Methodist Charge at Lenox and Alapaha district chaplain was named "Rural Minister of the Year" in 1962 by the *Progressive Farmer* magazine.

Georgia's soil and water conservation district supervisors agree that the work the chaplains are doing is bearing fruit. These are representative supervisor evaluations of the ministerial recruits to the conservation ranks:

Chairman K. C. Mayers of the Altamaha district: "The district chaplain fills an important position in informing the public about our district program . . ."

J. T. Mayfield, chairman of the Flint River district: "The district chaplain has been of great assistance during Soil Stewardship Week and on other occasions . . . We welcome this support."

Supervisor Steve Carver of the Blue Ridge district. "I don't know why we never appointed a chaplain before . . . We know now that a chaplain would have been very beneficial from the beginning."

Soil Stewardship on the Job

By Duane H. Lewis

SOIL Stewardship Week reminders from the pulpit helped to start today's growing practice of stubble-mulch farming in Washington State's Central Klickitat Soil Conservation District.

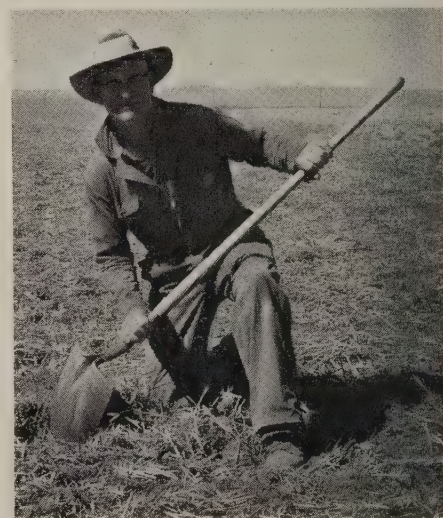
Five years ago, there was only one good mulch farmer in the entire district. Now 15 cooperators are using "chisel plows," and

mulched fallowland acreage has multiplied 126 times.

How did it happen?

"We told everybody about stubble mulch who would listen," says District Chairman Gus Trumbo. "Finally, a lot of people started helping, and then the farmers got interested."

Among those who helped were members of the clergy, who cooperated in using their pulpits during Soil Stewardship Week to



"Black summerfallow doesn't look good to me any more," Victor Ganguin said after his first year of stubble-mulch tillage.

Note:—The author is work unit conservationist, Soil Conservation Service, Golden-dale, Wash.

remind church-going farmers of their soil-saving obligations. District Supervisor W. F. Hornibrook, on whose place an early demonstration of tools used for mulching was held, met with the Ministerial Association and arranged for a tour to point out local soil and water problems. Most churches cooperated, and reports indicated that the clergymen put a good deal of enthusiasm into their sermons on soil stewardship.

The district's 1957 annual report had laid much of the ground work for helping the board of supervisors get stubble mulch accepted as a normal farming practice. After the district-sponsored demonstration on the Hornibrook place, someone still had to prove mulching was practical and paid off. Board members had gathered some facts, but more evidence was needed.

Trumbo and Hornibrook, by that time vice-chairman of the board, undertook to find out more about mulching in 1958. Such things as depth of tillage, timing, types of implements, fertilizer rates, weed control, and drilling were carefully watched. Soil-saving effects and satisfactory grain yields encouraged the district supervisors to work a little harder toward their goal.

Stubble that year was more than 2½ tons an acre after harvest on many fields. Long straw can be a headache in stubble mulching; so the district lowered its bank account to rock bottom to buy a stubble-mulching machine. The investment proved sound, because the machine kept many "first time stubble mulchers" from getting fed up with plugged rod weeders and drills.

Wider use of the practice, leading to its extensive application in the district today, followed an active information-education program:

District annual meetings in 1958 and 1959 featured talks on mulch farming by Agricultural Research



Ganguin's uniform fall wheat stand on stubble-mulched field that withstood 3 inches of rain in 3 days without erosion.

Service and Soil Conservation Service specialists.

In 1959, four equipment dealers agreed to rent farmers chisel plows, skew treaders, and drills best suited for mulching.

The weekly *Goldendale Sentinel* in 1960 published a 12-page conservation supplement on stubble-mulch farming.

And there was the Soil Stewardship Week cooperation of the clergy.

Finally, a cost-sharing payment rate for stubble mulching was approved for inclusion in the 1959 ACP County Handbook. The first year's records showed that stubble mulch was applied on 3,200 acres for which cost-share payments were received. About three-fourths of it was "new" mulching never used by the farmers before. Quality of the mulch also improved, with most mulched fields having from ½ to 1 ton of straw to the acre on the surface before drilling.

A real test of the effectiveness of stubble mulching in controlling erosion was not long in coming. In a 2-day period during the Thanksgiving holiday, in 1960, the area was deluged with more than 3 inches of rain. Two summer-fallowed fields were compared.

One was mulched with an estimated 1,400 pounds of straw to the acre, and the other was moldboard plowed, with practically no straw visible on the ground. The mulched field held, with no visible rills; while unmulched ground had small gullies about 100 feet apart and suffered a soil loss estimated at several tons an acre. And the winter had just started!

Similar rainfall tests in the ensuing winter seasons have confirmed times over the effectiveness of stubble-mulch farming in protecting the soil and the sound judgment of all those who helped give this conservation measure its first big push in this Washington area.

Starting Feb. 1, 1963, most of eastern Washington was covered by 8 to 9 inches of snow on ground frozen from 16 to 24 inches deep. The snowstorm was followed immediately by a "Chinook" with rains of cloudburst intensity. The result was spectacular erosion throughout the Palouse and Blue Mountain wheat growing areas. The loss of soil varied from 20 tons upward an acre. Flooding of streams was exceedingly heavy. Surveys showed that the loss of soil was in proportion to the amount of conservation practices on the land.

Jewish Farmers' Soil Stewardship Interest Has Been Inherited From Ancient Times

By Theodore Norman

THE Jews of Biblical times were farmers like all other ancient peoples. Driven from their land by the Romans, they were scattered all through Europe but were prevented from being farmers by social conditions of the times.

So they had to take up other work. However, with the economic and social movements of the 19th century in Europe and America, many Jewish people wanted to become farmers, because they still retained the ancient love of the land and because they believed that farming was the most noble occupation. In the last century Jews, mostly from Europe, immigrated to Israel and also to the United States, where no fewer than 30 Jewish farm communities were established.

Maurice de Hirsch was one of the greatest philanthropists of the 19th century. He wished to impress upon the Jews of Europe the opportunities for private landownership in the new world. "I shall try to make for them," he said, "a new home where as free farmers on their soil they can make themselves useful."

The work of Baron de Hirsch rested on this statement to thousands of Jewish families. One of his early works was the establishment of a farm community in Woodbine, N.J., which included the first Jewish agricultural school in the country. Among its graduates were the renowned soil scientist, Dr. Jacob Lipmann, and Samuel Bober, one of the leading field seed producers in the country.

In 1891, de Hirsch established

the Baron de Hirsch Fund, with an agriculture department which in 1900 was formally incorporated as the Jewish Agricultural Society. In the past 72 years, the Fund and Society have assisted thousands of Jewish families, mostly newly arrived immigrants, to become farmers by granting them loans and by providing them extension services.

The services of the Society were



Theodore Norman.

especially valuable in the period after World War II, when about 7 percent of more than 40 thousand immigrant Jewish families settled on farms. From 1908 to 1959, the Society published a bilingual monthly magazine, "The Jewish Farmer," which extolled the importance of soil conservation. This message was also carried to thousands of new settlers by our Extension Department.

Ukrainian-born Bober, of Newell, S. Dak., provides one of many examples of how Jewish farmers have made good in the United States. As the family struggled to make a living in the city after emigrating to St. Louis, Mo., in 1906, young

Sam felt a strong attraction to the land and decided to become a farmer. He went to the Baron de Hirsch School and to the Michigan State College of Agriculture.

After graduation, Bober took up a 160-acre homestead at Newell, on which he has remained, and where he laid the foundation for a certified seed business that has brought him international recognition as a producer of alfalfa, grass, and cereal seed. On farms totaling more than 10,000 acres he now operates with his sons, Louis and Jack, both of Rapid City, 3,000 acres are devoted to developing new varieties of seed.

Among them are several that are especially suited for use in soil conservation and land conversion planting in the Great Plains and Western States.

Through a cooperative arrangement, the Soil Conservation Service's plant materials technician used Bober lands for trials of grasses and legumes especially adapted to conservation uses, before the plants went into commercial production. The Bobers' own seed business accordingly has been built in no small measure on conservation-adapted seed. It was partly in consideration of this fact that Louis Bober was asked in 1963 to serve on Secretary of Agriculture Orville L. Freeman's Public Advisory Committee on Soil and Water Conservation.

The Bobers also raise Angus cattle. Their lands, operated as a single unit, all are under a conservation plan developed through the Butte Soil Conservation District; and they have applied for participation in the Great Plains Conservation Program.

Note:—The author is general manager, Jewish Agricultural Society, New York, N.Y.



Sam Bober in 2-year-old stand of Cossack alfalfa on Bober Farms at Newell, S. Dak.

Today's operation is a far cry from that when Sam Bober started out and literally had to build his original farm "from the ground up." He did so with the help of a job at the local Belle Fourche Experiment Farm. He used his experience to help others, demonstrating how to grow alfalfa on dry land, develop a crop rotation that produced better grain, and make a better living by using better methods. He has found time, meanwhile, to be active in farm organizations, is a member of the Ameri-

can Seed Trade Association's Soil Conservation Committee, served on the Federal Farm Credit Board from 1955 to 1962, and has been a member of the National Council of the National Planning Association.

By encouraging those Jews who desired to enjoy a self-respecting rural family life to achieve it through their own efforts, the Society has tried to give reality to its founder's dream and believes it has done so. I feel that in doing so, we are also conforming to the true American tradition.

As Rabbi Richard G. Hirsh of Washington, D.C., director of the Religious Action Center of the Union of American Hebrew Congregations puts, it: "We are told that it is man's responsibility to see that the earth is properly cared for.

"Today, in this blessed United States, ownership and care of land is available to all. And we may all examine the teachings of the ancients and profit from them. From the year 1654, when the first Jews arrived on these shores in New Amsterdam, to recent years, when as many as 10,000 American Jews derived their livelihood from farming, ancient Hebrew tradition and the modern American heritage of freedom with responsibility have joined together in the urgent work of soil conservation. I heartily commend the observance of Soil Stewardship Week and all that it signifies, for our children's children's sake."

It is indeed with wholehearted pleasure that I, too, subscribe, for the Jewish Agricultural Society, to the spirit and full meaning of Soil Stewardship Week.

Good Soil Stewardship Is Key To Fullest Land and Water Resource Use

By T. S. Buie

THE psalmist's reminder that "The Heavens are the Lord's Heavens, but the earth He has given to the sons of men" is but one of many Biblical admonitions of man's dependence upon the land.

Just as Adam, the first man, was made responsible for the Garden of Eden, so are we given responsibility to tend and care for the land and other natural resources entrusted to our care. Too often, however, down through the

generations man has used his land with little concern for the future; and throughout the world today millions of its people are hungry because the land at their disposal will not produce in accordance with their needs.

Even though the situation in the United States is much better than it is throughout most of the world, because no other people have had such a bountiful supply of natural resources at their disposal, we, too, have wastefully misused our land and water resources. Our progress in developing and using

our resources so as to establish the high standard of living and the strategic position in world affairs which we enjoy today has not been made without great cost. We have slayed the trees of the forest, abused the land on which they grew, muddied the streams, destroyed wildlife, and, in general, laid waste much of the land. In short, we have not always used our God-given resources in a manner which reflects our responsibilities.

One of the most important considerations of man should be to

Note:—The author is State conservationist, Soil Conservation Service, Columbia, S.C.

exercise proper stewardship of the land entrusted to him. Today, fortunately, we are giving more and more consideration to such stewardship, in the United States and in many other countries. The land once was regarded simply as belonging to an individual, to do with as he pleased—even to misuse to the point of its destruction if he saw fit.

Today's concept of ownership does not imply that an owner has such a right, even though he has legal title to the land, but rather that he is at best but a temporary owner. As always, the land is his to use, of course; but, voluntarily through his own soil conservation district, small-watershed, Great Plains Conservation, Agricultural Conservation, and other programs and incentives, he has come to use it in such a way that it will produce as may be needed, not only for his

own generation, but for those to come.

The change in attitude of people regarding their dependence upon the land is reflected in the fact that almost 2 million American farmers and ranchers now are cooperating with locally organized and directed soil conservation districts. These local units of self-government, 2,936 of them at last count, cover 93 percent of the country's farmlands and include 96 percent of its farms, in all 50 States, Puerto Rico, and the Virgin Islands.

The soil conservation district is the focal point for making available, at its request, the local, State, or Federal facilities available in the field of soil and water conservation, as well as contributions of various kinds from private groups, associations, corporations, and individuals. Soil Conservation Service technicians advise district land-

owners and operators as to how their land should be used and treated, but the farmers themselves decide what is to be done.

One of the most effective activities of the soil conservation districts in encouraging land users to recognize and live up to their responsibilities in husbanding our land and water resources is their sponsorship of Soil Stewardship Week each spring. Clergymen, laymen, and district officers work together in planning the observance.

The Federal Government has no official part in the soil stewardship undertaking, but the governors of some States issue proclamations on this special week. Those taking part in its promotion include, in addition to religious groups of different denominations, banker and other business interests, public affairs and other groups, farm journals and other magazines, newspapers, radio, and television.

How the church has a direct interest in soil stewardship and conservation is reflected in a study made a number of years ago of 222 rural churches in the former Upper South Carolina Methodist Conference. The study disclosed that members of the churches surrounded by the best land contribute \$1,135 annually for all purposes; but the figures for the intermediate and poorest land groups—suffering from comparable degrees of soil erosion—were \$762 and \$533, respectively. The contributions per member showed a corresponding range for those living on the best land and those in moderately and severely eroded areas.

Contributions for support of the pastors likewise varied directly with the degree of erosion. Although this study was made of a single denomination in a particular area, it is believed that comparable results would be found elsewhere and in churches of other denominations under similar conditions, irrespective of the size of the monetary contribution totals at the time of this survey or today.



Descendents of the pioneer communicants of rural St. James Episcopal Church in Charleston County, S. C., are active in conservation and other present-day agricultural affairs.



Blessing the seed and field adjoining St. Peters Lutheran Church at Lexington, S. C., by Pastor Alvin H. Haigler after the 1962 Soil Stewardship Sunday sermon.

Urban or other people who might question the need for emphasis upon soil stewardship and conservation well might be reminded that

today's oversupply of certain products of the land could become a scarcity tomorrow in the face of our rapidly increasing population

This Family Farm Is Based on Conservation

By Sherman Briscoe

RICHARD SMITH of Hometown realized from the beginning that the southern Maryland farm he picked out 17 years ago was a poor one but he was determined to try to overcome the limitations of its deep gullies and steep slopes.

The 56-acre place lay in a hilly section of Calvert County, whose best crops are tobacco and timber. Smith and his wife first viewed the farm shortly after their marriage in 1946, following his return from the Army. In spite of the

shape the land was in, it seemed the best of the few places they had seen for rent, and the next year the couple moved in.

They had made some headway in filling in gullies and controlling erosion, and in increasing the yields of tobacco and corn, before they decided to buy the farm 5 years later. But long before they made the down payment, Smith knew he was going to have to find a better way to farm the rolling land and hillsides. Here was a challenge for a good land husbandman.

He had observed contour strip-

and ever-possible emergencies. Requirements for food, clothing, raw materials for industry, and land- and water-based recreation all have increased greatly during the past few years. Their continuing increase makes essential our careful conservation of the soil, water, timber, wildlife, and other natural resources for which we are responsible. Meanwhile, any land not presently needed for production of food and fiber can, and should, be used for such other purposes as for providing needed recreation facilities or growing trees or grass.

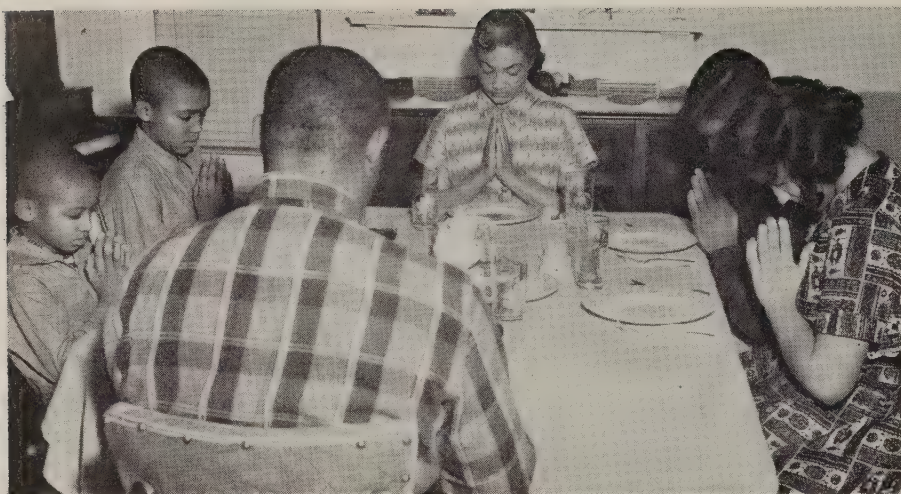
Soil and water, which are virtually inseparable, will continue to be essential to our daily living—to a well-fed, well-clothed, and well-housed people, and a country strong in the family of nations. The discharge of our responsibilities in good soil stewardship is the key as we move forward in the fullest use and enjoyment of our land and water resources.



Better quality and higher yields of tobacco have resulted from Smith's conservation farm. (L. to r.):—Assoc. Co. Extn. Agent Gaston C. Finney, Smith, and son Royce.

cropping on a few of the farms in his community, and had been told by his county agent of the advantages of the system in conserving moisture and preventing erosion.

Note:—The author is information specialist, Office of Information, Washington, D.C.



The Smiths take care of their land and their land takes care of them. For this blessing they are thankful.

A talk with a Calvert Soil Conservation District supervisor brought a Soil Conservation Service technician to his own farm.

Shortly, Smith had worked out a complete conservation farm plan with the technician's help. It called for contour stripcropping his 6.38-acre tobacco allotment, 4 acres of orchardgrass, 4 acres of corn, and 3 acres of Alyce clover in a 2-year rotation on the rolling land and less precipitous slopes. The steeper slopes were to be devoted to grass or trees.

Many yards of terraces he has built, soil testing, proper applications of fertilizer and lime, and the seeding of vetch and other cover crops round out Smith's conservation farm plan in operation today.

"I have never seen a farmer follow a conservation plan more religiously than Mr. Smith," says District Extension Agent Martin G. Bailey, "He follows contour lines with precision, plants the grass recommended—not a substitute—and applies the exact amount of fertilizer called for, not a rough guess."

As a result, Smith's tobacco yield has risen from 700 to 1,200 pounds to the acre, and his corn, grown for feeding to his own stock, has jumped from 38 to 70 bushels an acre.

"I get about as much corn now

off 4 acres as I used to get off 8 or 9," he explains.

Smith had never dreamed his farm would produce like this: A corn yield 16 bushels an acre above the State average, and a tobacco yield that exceeds the State average by close to 300 pounds an acre.

Within 2 years, the Smiths completed payment on their \$7,000 farm; the next year they paid the last note on the tractor; the fourth and fifth years brought money for two additional barns for their extra tobacco; and the sixth provided funds for modernizing the home

and covering it with attractive asbestos shingles.

Besides tobacco for market and the corn for feed, the Smiths and their four children raise timber and plenty of food for their own table. The trees are cut selectively every few years and, where needed, the area is reseeded.

Food for the most part is grown by the children as part of their 4-H Club projects. Royce, 15, looks after the cattle and hogs; Cordell, 11, takes care of the poultry flock; Cordelia, 13, tends the garden and helps her mother prepare foods for their 15-foot home freezer; and 5-year-old Mark is anxiously awaiting the day he will be old enough to board the tractor and drive into the field.

But ample food, a good home, and a productive farm are not enough for the Smiths. They also want their children to be well educated. To this end, Smith has taken a full-time job as a crane operator at the nearby Naval Research Laboratory.

He and the older boys do the farm chores in the afternoons and evenings and on Saturdays. Last year, Royce had an acre of tobacco all his own, and banked \$800 to-



Smith (l.) tells District Extension Agent Bailey how contour stripcropping has improved his tobacco, corn, and hay production.

ward his college fees.

"As Mr. and Mrs. Smith sit on their screened-in back porch at the end of the day, looking across

their rolling acres, they can take pride in their stewardship under which the land is being enriched and preserved," says District

Agent Bailey with a note of pride reflecting his own part in helping to bring about this successful conservation farm development.

CONSERVATION AND THE MINISTRY



CONSERVATIONIST:—Technician Bozeman (l.) in the field.



MINISTER:—Rev. Bozeman in pulpit.

J. A. BOZEMAN of Tennessee speaks with the authority of long experience on saving both soil and souls.

Johnie, as he is known and signs himself, is work unit conservationist of the Soil Conservation Service in the Davidson County Soil Conservation District at Nashville during his Government work days. On his own time on Sunday he is a Methodist supply minister and pastor of the Slaters Chapel Church at nearby Millersville.

Mississippi farm-reared Bozeman has been combining agricultural work and clerical duties for 20 years. He first was licensed as a local preacher in 1943 while still a County Extension agent at Waynesboro, Tenn. The Mississippi State University agricultural engineering graduate has continued his ministerial duties since trans-

ferring to the SCS in 1945. This is how he finds his two professions go naturally together:

"I took up the calling of the ministry because I felt called of God to render an even larger service, more especially to rural people. I have felt for a number of years that the work of a soil conservationist and a minister are closely linked together.

"I feel that stewardship of soil is a God-given responsibility and offers a big challenge to any minister to promote and encourage the conservation of all natural resources, because the conservation of our soil and water ultimately means the conservation of souls. Therefore, it is impossible to separate man from the land.

"As the soil goes, so goes man; and the process doesn't take long. Thus the work of a soil conserva-

tionist and that of a minister go hand in hand."

And down in Jessup, Ga., the Rev. Peyton E. Splane, Jr., of St. Paul's Episcopal Church also knows what he is talking about when he gets up to give a Soil Stewardship Sunday sermon. He was an SCS technician in Louisiana and Alabama for 11 years before he went back to school to prepare for the ministry.

Reverend Peyton still keeps his hand in soil and water conservation matters as chaplain of the Satilla River Soil Conservation District. He also has been active in furthering Soil Stewardship Week, by organizing church observances, meeting with ministerial groups in the eight-county district and attending conservation tours with them, and making soil stewardship tapes used for radio stations.

Farm Wife Finds Conservation Farming Rewarding

By Mrs. Roswell A. Jacobsen

WHAT has happened since the start of my life as the wife of a husband devoted to "the tilling of the soil" could read like a book. It is difficult to know where to begin telling just "what" and "how" has brought us to where we are today. The years have not been easy, but fruitful in so many ways.

We have learned the joys of a family working together—planning to make improvements and setting a goal to work toward on our Minnesota farm. We know the nearness of God everywhere—in the harvest of a good crop—in the rage of a storm.

I found being a wife and mother of four young sons is not sufficient when farming is your livelihood. It includes so many different jobs that only "Jill of all trades" could describe it.

I do not remember my thoughts

when 14 years ago I left the humdrum of the city life to become a farmer's bride. This new life was completely different, and strange. The first year I sat back and watched others hard at work. I had a "left out" feeling. But I did not want to be left out; so I began to learn.

What did I learn? The best way to explain is that I have done everything except plow a furrow. That job is reserved for my instructor—my husband. I have conquered any other job on our 200-acre dairy farm, because each job is a challenge that I just have to conquer.

No one can live on a farm long and not realize the importance of proper soil management. We have so many times said that it is far more profitable to make our own soil more tillable by proper fertili-



And all the family members likewise are proud of Mrs. Jacobsen's painting and other artwork.

zation and drainage than to go ahead and rent more land. We have proved this to be true.

Roswell, my husband, was a member of the Board of Supervisors of the North St. Louis County Soil and Water Conservation District, and acted as Secretary-treasurer, for 5 years. During and since that time I have aided in the planning and erection of a booth at the St. Louis County Fair each year.

I oftentimes have been asked what my feelings are in regard to farm life. My very prompt answer is "that I would never be able to return to living in the city." I do not wish to give the impression that farm routine takes up all my time. I still manage to take part in several projects and hobbies. There is a great deal of sewing for all the members of the family that I do. Since our boys are of 4-H age, we both take part in that organization's activities. Roswell helps in dairying, and I have been conservation leader in the past.

There is time, also, to direct the church choir in the town where the boys go to school. During the winter months, I attend evening classes in art. My main interests are wood sculpture and oil painting.

Let's say, then, that country living has many rewards, despite the fact that its monetary return is too meager. I like the thought that "The earth is the Lord's—conserve and you shall not want." This is one of the themes we used in our County Fair booth.



The Jacobsen family is proud of being a soil and water conservation district cooperator. (l. to r.): Tim, Kenneth, Mrs. Jacobsen, Conrad, Ross, and Jacobsen.

Note:—The author is farm wife, Ros-Bee Acres, Iron, Minn.

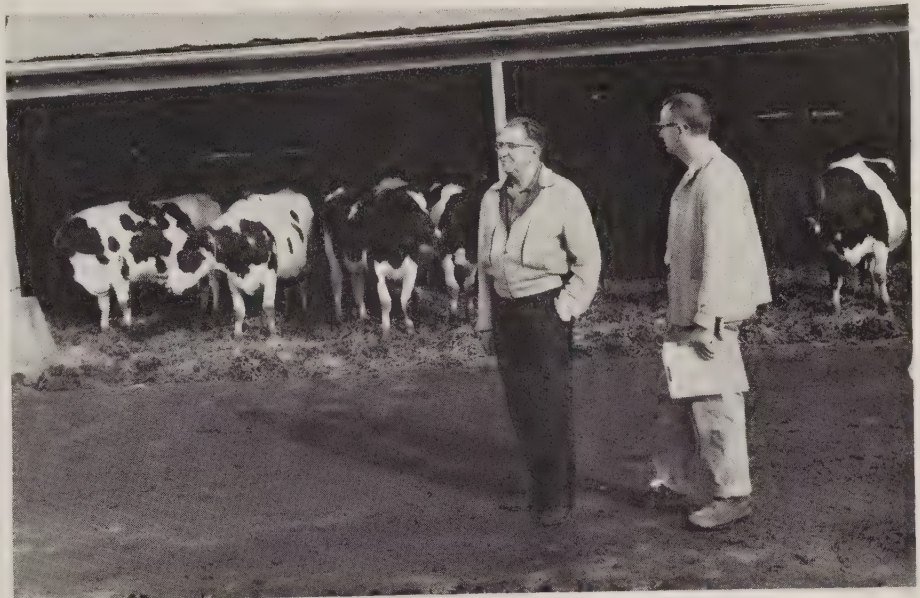
Mormons Soil-Water Stewards For More Than a Century

By John Bradshaw and Norma Yourchik

HUSBANDING their soil and water resources to produce food and other necessities has been a "must" with the Mormons since pioneers of the Church of Jesus Christ of Latter-day Saints left their homes in the East more than 100 years ago to establish a new life in the West. Their settlements were located where water from streams and springs made agriculture possible.

It is not surprising, then, that approximately 150, or about 80 percent, of all Mormon Church farms in Utah, where they first settled, today are soil conservation district cooperators. Complete conservation plans have been developed on about 125 of these farms.

From the time the first Mormon emigrants drove their wagons



Pres. Money and SCS Work Unit Conservationist Lowe check on Stake dairy farm's conservation operations.

down into the Valley of Salt Lake, in the area around what is now

Salt Lake City, on July 24, 1847, their first thought was of agriculture. They had to raise food to survive. Though the first season was late, they tried to plow the hard, cracked, and dried Utah soil. After many tries, and many broken plows later, they knew that some way would have to be found to soften the earth before it could be plowed or seeded.

Finally, an idea came to mind—divert City Creek water to the land to soften it. In a matter of days, the first irrigation ditch was built, the soil plowed, and potatoes planted. Thus began the first irrigational agriculture by emigrants in the West. The Mormons harvested a crop of small potatoes that fall. Part of the crop was



Nebo Stake President Reed J. Money (l.) and Bishop Clyde T. Lowe, of Payson, Utah, in field on conservation-treated Nebo Stake Welfare Farm.

Note:—The authors are assistant State conservationist and secretary, respectively, Soil Conservation Service, Salt Lake City, Utah.

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saved for seed the following year. The remainder was the only vegetable they had that first winter, other than wild plants growing in the foothills and mountains.

As agriculture developed, many conservation problems faced the Mormon Utah farmers. Too much water caused drainage problems. Irrigating sloping and uneven land caused severe erosion and uneven distribution of water. Streams fluctuated from high flows in the spring to nearly dry stream beds in the late summer. Fertility in many areas declined rapidly.

The Mormon Church acquired farms to provide food for the indigent. These farms, operated by part-time or full-time manager with up to 80 percent member-donated labor, still are a part of the church's welfare program. Generally, they are ward farms which serve the smallest segment of the church organization. These groups are comprised of approximately 200 to 600 people, with stake (geographical areas) farms serving 8 to 10 wards.

The Nebo Stake Farm demonstrates the kind of conservation program being carried out. It has been a cooperator with the Nebo Soil Conservation District since 1950. Operated by a farm manager under supervision of Nebo Stake President Reed J. Money, this farm comprises 65 acres supporting a 50-cow Holstein dairy

herd. A total of 90 head of cows, calves, replacement heifers, and drys are run on the farm.

In accordance with the conservation plan, all liquid and solid animal waste is stored in catchments to prevent loss of nitrogen, and commercial fertilizers are used



Well-maintained LDS rural ward church in Booth Valley, Utah, also is youth recreation center.

to supplement the manure. The conservation crop rotation consists of alfalfa, 4-5 years; small grain, 2-3 years; and corn for silage, 2 years. Land leveling has been completed on 36 of the 40 acres planned for this purpose. As soon as 4,300 feet of canal lining has been installed, proper water use will be a reality on 55 acres of irrigated cropland. Approximately 1,000 feet of streambank protection has been planned.

The farm is a member of the

Dairy Herd Improvement Association. The herd production is high, averaging 13,450 lbs. of milk per cow-year and 526 lbs. of butterfat per year. The top cow produces 6 percent butterfat.

The Nebo Stake Farm is one of 12 church farms on which Soil Conservation Service technical help has been provided through the Nebo district by the staff of Work Unit Conservationist Clyde T. Lowe, a Bishop of an LDS ward in Spanish Fork. Eleven of the 12 farms have completed conservation plans.

In addition to practicing conservation on most of its farms, the Mormon Church observes Soil Stewardship Sunday in most of its churches throughout Utah. District supervisors, district co-operators, and church leaders are called on to make addresses for soil stewardship observances. Many bishops and other church leaders are members of soil conservation district boards.

Be ye ashamed, O ye husbandmen; . . . —*Joel 1:11*. They have made it a desolation, in its desolation it mourns to me, the whole land is made desolate, because no man layeth it to heart. —*Jer. 12:10-11*.

. . . and the flame hath burned all the trees of the field. —*Joel 1:19*

And they . . . felled all the good trees:—*II Kings 3:25*.

JUNE 1963

Soil Conservation





Soil Conservation 25 Years Ago

It's a spectacular scenery. Sightseers come hundreds of miles to look at it. But it's scenery that Stewart County (Ga.) could do better without. . . .

"The big gullies involve some 70,000 acres. And the giants grow fast and faster, as if stimulated by an overactive geologic gland. The lengthening process continues until the top of a ridge is reached. Highways are moved over and over again, and still they cannot get far enough out of the way. You can see the old roads of last year and the year before, where they run to meet a gully, pause for a jump of 15 or 20 yards, resume on the far side. . . .

"Here is one road in proximity to a gully head that looks as if it might not have to be shifted any more. That's because the Soil Conservation Service tried the expedient of a diversion ditch."



COVER PICTURE.—Mile upon mile of conservation patterns unfold for today's air or land traveler across America—signposts to a fuller future for all.

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Soil Conservation

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Secretary of Agriculture

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Administrator, Soil Conservation Service

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FRANK B. HARPER, Editor

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Louisiana Bankers Travel Far To Study Conservation

By Leon Sisk

LOUISIANA bankers have found the first-hand study of conservation on the land so rewarding that they are entraining in July for their 9th conservation excursion into other States.

"The results have been far ahead of any thing dreamed of when the first tour was being planned in 1947," says President Richard S. Thompson of the Louisiana Association of Soil Conservation District Supervisors, who heads up this year's tour with President W. Richard White of the Louisiana Bankers Association, the two sponsoring organizations. "We get a lot of good, specific information about farming, and we get a lot of inspiration, too."

"Over the years, the visiting groups have learned secrets of successful farming out on the land from some of the best farmers in nearly three-fourths of the States in the Union. And Louisiana farmers have put what they learned on the tours into practice on their farms back home with the active encouragement and financial help of the Louisiana bankers. I believe that every phase of our agriculture has been improved."

It was in July 1947 that a special train carrying 147 bankers, soil conservation district supervisors, and just plain farmers moved out of its terminal in New Orleans bound for points in Texas, Oklahoma, Kansas, and Arkansas. On July 21 this year a diesel-powered train of modern sleeping cars will glide out of New Orleans' Union Station headed for Colorado, Wyoming, Iowa, Nebraska, and Illi-

nois. On board will be 190 Louisiana bankers, farmers, and representatives of other groups, traveling at their own expense.

In the 16 years the equipment



Big wheels on tour (l. to r.):—B. J. Glenwood, general passenger agent, Illinois Central RR; Pres. Richard Thompson, Louisiana Assn. SCD Supervisors; W. P. Sevier, Jr., past president, Louisiana Bankers Assn.; R. Irby Didier, Bankers Assn. executive vice president.

has changed; but the objective of the tour is still the same. It is to give the bankers and others an opportunity to rub shoulders with farmers in other States and see what they are doing to conserve their soil and water resources.

The idea for the tours originated with State Conservationist H. B. Martin of the Soil Conservation Service and R. Irby Didier, executive vice president of the Louisiana Bankers Association. W. T. Nolin of Hamburg, then president of the Louisiana Association of Soil Conservation District Supervisors, also had an active part in organizing the tour.

The original idea, in 1946, was for a group of representative bankers to tour the State to learn more

about soil and water resources and farming operations on which sound bank loans might be based. But as the plan developed, it generated such widespread interest among bankers, SCD supervisors, and representatives of industrial and other groups that it had to be expanded from the outset.

By the time final arrangements were completed, the initial 1947 farmer-banker tour included leading Louisiana farmers, landowners, bankers, and civic and political figures. They traveled 1,000 miles in four States. That tour and the rest that followed have taken the bankers and others into 28 States and the District of Columbia. They have been as far as the West Coast, the Canadian border, New York City, and south Florida.

It is difficult to tell bankers from farmers in the group as they plod the fields by day and ride the train by night. Standard attire for all members is work clothes and a L-O-U-I-S-I-A-N-A cap. During the day they also meet and discuss mutual problems with outstanding men of similar interests in the host States. Back on the train, they relax and talk about what they saw on the farms they visited.

As a result of this procedure, farmers and bankers have learned together on these trips what makes western beef cattle well upholstered with steaks and roasts, what makes cows in the best dairying sections give good milk, and how good farming communities maintain and improve the productive capacity of their soil.

Didier believes that more than anything else the tour "has been the medium that brought Louisiana

The author is field information specialist, Soil Conservation Service, Spartanburg, S. C.

farmers, bankers, and business people together with a desire to resolve their mutual problems.”

“After the depression, I couldn’t quite understand the farmers’ situation (and I was close to farming as operator of a small country bank in Avoyelles Parish),” he recalls. “By the same token, the farmers couldn’t understand our position. The tour went a long way toward resolving that stalemate, by bringing farmers and bankers together and reestablishing the understanding that must exist between them. It has been a builder of good will as well as educational.”

“This closer understanding among farmers and bankers of each other’s problems that now obtains is a very fine thing,” in the opinion of Marion Monk, formerly State president of the Louisiana Association and now president of the National Association of Soil and Water Conservation Districts, who has been on every tour since 1954. “Also, in my opinion it is a fine thing for our farmers to make these trips and see what the other farmers in another part of the Nation are doing. It gives them an opportunity to see things they need to put into practice on their land back home; and occasionally they see things that make them



A lot of water conservation like this is to be seen on 1963 tour.

realize they are doing well.”

One tangible result of the tours is the milkshed at Alexandria, a million-dollar operation that resulted directly from a visit in 1947 to the Sylvania Community in Arkansas, where 10 years before the farmers were trying unsuccessfully to grow cotton on eroded and worn out land. Then they switched to grass and dairying, and the community started prospering. A going dairy program now is in effect on family farms in central Louisiana. A rice-crawfish rotation system now being established in southwest Louisiana is similar to the fish-rice rotations also observed in Arkansas in 1957. Increased interest

and activity in feeder lots and in irrigation have been observed since the Far West tour in 1959.

Still another benefit to the agriculture of Louisiana has been the introduction of Coastal bermudagrass, which was first seen at Tifton, Ga., in 1954. Today, some of the largest shipments of Coastal bermudagrass hay in the Nation come off farms in north and central Louisiana, where thousands of acres of this conservation and forage crop are being grown.

Didier points out that the tours also are doing a fine job of selling Louisiana to other parts of the country. They have been responsible for several out-of-State businesses’ setting up in the State, he says, and they have interested people in many sections of the Nation in coming to Louisiana and making business contacts with banks, industry, and agriculture. Included are many from the West who have come to buy cattle since operators of feeder lots learned about the size and bone development which enables the Louisiana animals to put on more weight faster.

This year’s tour leaves New Orleans Sunday, July 21. Monday morning the group detrains at Kankakee, Ill., and travels by bus to Chicago. Stops along the way will be made to study soils, crop rotations, water-management practices, drainage, grade control structures, grassed waterways, and other conservation measures.



The train that takes Louisiana bankers and farmers as far as Illinois on their 5-State conservation tour.

Next, the Louisianians will visit farms and farm machinery plants in the vicinity of Des Moines, Iowa. Wednesday will find them in the Sandhills of Nebraska,

an area noted for its grass and cattle. Then in Wyoming they will visit a cattle ranch. Before leaving for home from Denver on Friday the 26th, they will study

cattle feeding operations, irrigation farming, and farm and ranch operations carried out through the Great Plains Conservation Program in Colorado.

Conservation Plantings Protect-Beautify Roadsides

By J. E. Clay

MOTORISTS traveling State Highway No. 10 may rest their eyes on green young pine trees growing along 16 miles of roadside from the Kentucky line to the Trousdale County line in Tennessee.

The tree plantings are a product of an undertaking dating back to early 1961, when the board of supervisors, Macon County Soil Conservation District, planned a number of roadside beautification and stabilization projects along State highways. A. L. West, district engineer, Tennessee Highway Department, agreed to furnish la-

bor and tools, and the district agreed to provide the materials.

The district bought 1,000 pine seedlings, which were set out on eroded areas along Highway No. 10. During the spring of 1961, 1,000 kudzu plants also were set out, on a steep road cut. In early 1962, the Tennessee Division of Forestry donated 5,000 pine seedlings to the district for additional roadside planting.

The Soil Conservation Service, meanwhile, furnished seed for trial plantings of crownvetch and kudzu. Daylily and iris bulbs also were planted on an eroded area



This roadside conservation and beautification trial planting of crownvetch is 14 miles west of Lafayette on State Highway 52. (SCS Work Unit Conservationist J. E. Clay.)

along the highway. The district has fertilized the kudzu, sericea, and pine plantings.

The State Highway Department put up nine black and white metal signs at the planting sites in the fall of 1962. In addition to making the signs and supplying labor to make the plantings, the Department furnished a crew to clear out around the pine seedlings so they could be easily seen by highway maintenance crews during mowing and other operations.

As a result of this cooperative work in roadside protection and beautification, landowners have become more interested in making the roadbanks adjoining their property more attractive. Several farmers have seeded and mulched roadbanks and made plantings.

Still another boost to the district conservation program has been an increase in the number of pine seedlings ordered by farmers to set out on poor, eroded areas on their farms.



The cooperating agencies are determined to protect the 6,000 fragile young pines set out along State Highway 10 miles north of Lafayette, Tenn.

The author is work unit conservationist, Soil Conservation Service, Lafayette, Tenn.

Dune Erosion Control—

BATTLE AGAINST THE SEA

By Robert F. Tegner

TOURISTS and summer residents who travel by automobile or bus to Oregon's coastal resort areas owe no small part of the recreational facilities they enjoy to more than a quarter of a century of concerted private and governmental efforts to hold back encroaching sands from the Pacific Ocean.

Sand dune erosion control, the conservationists call the protracted battle against wind and tides that long have rolled land-smothering sand in from the sea at vulnerable points on both the Pacific and the Atlantic coasts, as well as on the Gulf of Mexico and in some Great Lakes shore areas. The success of soil conservationists and foresters in this odds-on battle—in cooperation with farmers and other property owners and local government—has been notable on Oregon's historic upper coast.

The principal campaign in this area might be called "the battle of the Warrenton dunes." It was fought out along a 20-mile reach of sand-plagued shore extending

southward from the mouth of the mighty Columbia River to Tillamook Head in northern Clatsop County. Captain William Clark of the famed (Meriwether) Lewis and Clark Expedition described this Clatsop Plains area they reached in 1805 as rolling grassland.

Travelers of U. S. Highway No. 101 to the historic port city of Astoria and county seat above the mouth of the Columbia, or to the resorts of Seaside or Cannon Beach, might think it always has remained so, when they go sightseeing into the oceanside dunes area and gaze over the expanse of grass, brush, and trees that now grow right down to the edge of the Pacific. But, to the contrary, the grass that grows abundantly now on the great foredune represents victory in the long battle of conservation and survival for the people on dune-threatened lands a mile or so inland.

Twenty-eight years ago, in fact, when this battle of the dunes was joined, the wreck of the four-masted schooner, the Peter Iredale, that ran aground there in 1906 and has remained a popular attraction for sightseers, was separated from any vegetation by bare, still-moving sand dunes. A plank road leading to the site was mostly covered by sand; and cattle paths were cut deep into the sand of older back dunes used as pasture.

The battle of the Warrenton dunes was begun by farmers, home and resort owners, and others of the area. County officials joined their ranks; and, in 1935, the Soil Conservation Service went into

action with a company of Civilian Conservation Corps youths, headquartered at Warrenton, to plant beachgrass and set out trees and shrubs. Responsibility for the dunes stabilization work and its maintenance was taken over in 1941 by the newly formed Warrenton Dunes Soil Conservation District.

At the start, 3,000 acres of sand dunes were "on the move"—creeping onto pastures and forests, filling in lakes, and hindering navigation, both on smaller coastal streams and the Columbia River itself. The late Chief Hugh Bennett of the Soil Conservation Service estimated that forts, military reservations, roads, and private property valued at \$22 million were menaced, and that the oncoming dunes were threatening to impede nearly \$300 million worth of ocean-going commerce on the Columbia River. Landowners and county officials turned to the Federal Government for help.

When work was started in 1935,



What scrap salvagers left of old beached schooner Peter Iredale after 2 world wars.



Beach homes now can be built safely—with inviting scenery instead of bare dunes.

The author is field information specialist, Soil Conservation Service, Berkeley, Calif.

many plants and devices—like barriers of snow fence to hold back sand until the plants could establish themselves—were tried before the winning combinations were hit upon. European beachgrass proved to be the most successful in first stilling the sand, and a nursery was set up to propagate stock. Next came the woody plants—shrubs and trees—to further protect the unstable sand area. Scotch Broom and Shore Pine have proved most effective here. Indeed, pine has thrived so well that firebreaks have had to be cut at intervals as a safety measure.

Meanwhile, when the CCC Camp was closed early in World War II, landowners organized the Warrenton Dunes district to take over the work. The district, including 5,800 acres then, has been enlarged twice since and now includes 24,260 acres. The locally run district was in position to deal with the dune control problem on a long-time basis.

Because part of the cause of the erosion was overgrazing and trailing of cattle, and taking off native vegetation for buildings, roads, and other developments, some means was needed to protect against such encroachments in the future. Land use regulations and zoning of the area were voted by owner-cooperators in 1948. In one zone grazing, tillage, and construction of buildings were prohibited. In the other, grazing and tillage are prohibited, but building of homes and development of recreational facilities, with safeguarding limitations, are permitted.

There are other results which are less evident than the vegetation seen growing on the dunes, but which are just as real and important to the people of Clatsop County. For one thing, the tax base has been broadened. In 1945, to illustrate, Barney Lucas bought a strip of ocean frontage 10,000 feet long and 1,100 feet wide, developed building sites, and put in power and water and roads. With



ABOVE (1938):—Plank Sunset Beach road already protected from drifting sand as beachgrass was taking hold on adjacent dunes in 1938. **BELOW (1963):**—Today's surfaced road—1 mile west of 18-hole golf course flanking U. S. Highway 101 5 miles north of Seaside resort—crosses permanently vegetated and protected dune area.



Recreational development of Coffinbury Lake in Fort Stevens State Park to where it accommodated ½ million visitors in 1962 was made possible by work of Warrenton Dunes SCD.

technical help from the SCS, he carried out a stabilization and maintenance program. Many homes and \$100,000 a year in additional taxes have resulted.

This is but one example of what the victory in dune control in Clatsop County has meant to the local economy and to tax coffers up the line. Other benefits include better protection of Columbia River shipping lanes; development of Fort Stevens State Park—which offers both salt and fresh water fishing and last year drew half a

million visitors—and of a State game preserve. Also to be seen in the area is the site of Battery Russell, which was the target of offshore enemy shelling in World War II, and nearby Fort Clatsop, now a national memorial monument, which was a Lewis and Clark military post.

Important, too, has been the recovery of good agricultural land for the production of forage and other crops. Meanwhile, development of the Skipanon watershed protection and flood prevention

project, sponsored by the Warrenton Dunes district and Clatsop County, is under way immediately to the east of the dunes area proper. It includes stream channel improvement and lake level control structural work.

A similar battle against sand dune encroachment is now going on farther south along the Oregon coast, at Florence. The experience at Warrenton is providing much help in containing this other sandy playground, which also threatens to engulf river and farmland.

New Aerial “Portrait” Helps Map Brighter Future for Maine County

By Floyd W. Campbell

MAINE'S York County has just had its picture taken again after 22 years. County leaders are glad they decided on the new photo-mapping sittings, because they show that York County still has plenty of resources worth conserving and using for brighter years ahead.

The up-to-date aerial mapping is part of a fight to speed up economic recovery. The goal is to reverse a trend that has included losses in textile-, shoe-, and machinery-making jobs in the past 2 decades, thousands of forest acres blackened by fires, family farms becoming marginal operations, and shore fisheries hit by water pollution.

Through their Commissioners, the 70,000 residents of the county caught the attention of the U. S. Department of Commerce. As a result, a Biddeford-Sanford Area Redevelopment Authority Committee was set up. It is headed by Lewis K. Marshall, a retired automotive engineer. Harold S. Brook



New aerial photo-map helps local residents like the Arthur Lougees (l.) obtain accurate information on their farm or other property.

of Maine's Department of Economic Development in Augusta represents the State's interests.

The ARA program included financial provisions for an aerial survey of the entire county. The Soil Conservation Service supervised the project.

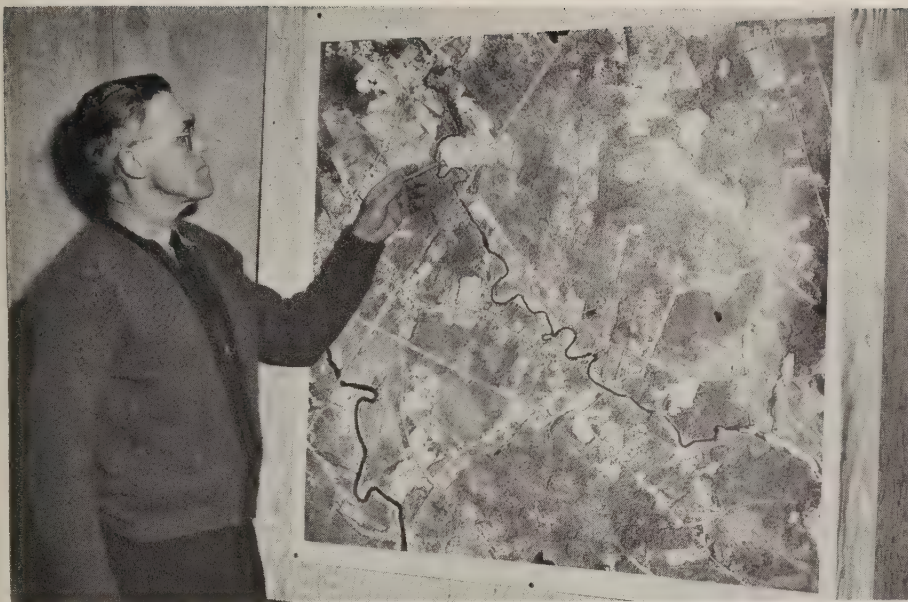
York countians knew that

changes had taken place since the earlier aerial maps were made, but now the 9"x9" individual photo-prints taken by the high-flying camera plane brought out the details. Interpreters in several technical agencies set to work itemizing the changes—the story of York's past and future written plainly in the county's soils and waters and captured on film.

“These new views will really give our work the gun,” said Delbert L. Moody, the SCS consultant. “They'll help our work with hundreds of soil conservation district cooperators. We've had cases where, for example, old maps showed woodland; and we'd get over there onsite and find it had turned into a housing development. Another thing, the photos will vastly expedite our activities in flood prevention and watershed improvement. We can now pinpoint engineering locations and land-treatment needs.”

The high-quality new photographs, showing recent road and

The author is State conservationist, Soil Conservation Service, Orono, Maine.



York County's new picture. SCS technician, pointing to timbered area that formerly was plowed land, finds new air photos speed conservation planning, because they are easier to read, more accurate.

housing developments, also help the soil scientists map faster and more accurately in the acre-by-acre soil survey under way in the county.

One of the liveliest phases of the aerial photos' usefulness has shown up in town planning. Several of the 22 York County towns which recognize that reexamining their resources is a first step to their economic improvement have purchased photo-prints for this purpose. Planners already have spotted scores of new sites for recreation, wildlife, and industrial and water-storage developments as expanded community features. ARA Committee Chairman Marshall estimates that the aerial survey pictures, which cost towns an average of \$50 a set, thus have saved townships thousands of dollars apiece that might have been spent for special, individual mapping projects.

The camera flights eventually will play a large role in restoration of York County's woodland industry, in the opinion of Richard Arsenault of the Maine Forest Service.

"Now that we can see which way and just where our timber re-

sources are going, we've gotten several firms interested in new wood-processing plant locations," he pointed out. "By putting the old and new shots side by side, we get an excellent evaluation of the extent of burned-over areas, types of trees and their growth, and a very accurate idea of how much replanting we're going to have to do."

A hopeful outlook by local farm-

ing experts also is confirmed in evidence collected by the camera eye in the sky: For example, there is splendid blueberry land in York, and berry production is coming up fast. York apple orchardists long have been recognized as the most successful in the State, but fruit-processing and marketing traditionally have been carried on elsewhere. New local processing plants, for which the photo-maps reveal plenty of suitable locations, would help absorb surplus labor. Couple them with wood-manufacturing enterprises, the local planners believe, and the soils and waters of this area truly would be harnessed to needs of the people.

York countians are taking other steps in their "operation bootstrap." Thus they have squads of alert citizens sounding out many aspects for improvement, such as retraining manpower, salvaging shore fisheries, attracting new industry, and putting all the pieces together as an overall economic development program. They also are inviting assistance through the teamwork of Federal and State agencies, such as that represented in the U.S. Department of Agriculture's Rural Areas Development Program.



This new industrial plant, expected to employ 600 people, is one of many projects aimed at attracting new business, industry, and agricultural development to the county.

Student Geographers-Farmers Study Conservation From the Air

By Benjamin F. Richason, Jr.

STUDENTS in the geography department of Carroll College at Waukesha, Wis., take to the air when they go on field trips.

Traveling in as many as half a dozen planes on a single flight, an average of almost 200 students a year have been taken on these field trips since they were started 5 years ago as a visual aid technique. More than 180 farmers have been conducted on similar tours to study soils, erosion, and conservation.

This unique pedagogical experiment was so successful that today aerial field trips are a regular part of the curriculum in earth science, geography of soils, geography of Wisconsin, aerial photo interpretation, and conservation of natural resources. The geography department cooperates with the Soil Conservation Service and the Waukesha County Agricultural Agent in conducting aerial trips for farmers, sportsmen, and professional conservationists.

The principal value of aerial field trips lies in the fact that altitude decreases the scale of the earth's surface, and, like a map, makes possible the immediate observation of large areas. Also, surface field observations that normally would require many hours, or even days, can be accomplished in much shorter time by plane.

Most of the Carroll College aerial trips last from 45 to 70 minutes at an estimated cost of \$1 for 10 minutes of actual flight time. The conventional route, starting at Waukesha, loops some 80 miles through the Wales, Big Bend, Muk-

wonago, Eagle, Dousman, Chequamegon, Sussex, and Lannon areas.

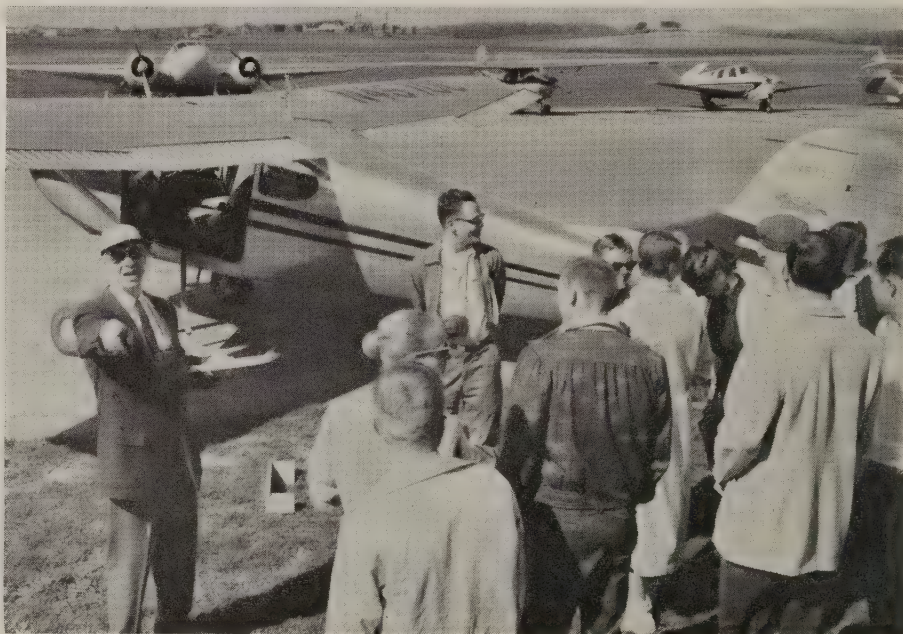
One of the most prominent features of the earth's surface as viewed from the air is the agricultural use of land. How man has used, or abused, the land is immediately apparent.

Surface water and drainage patterns are easily recognized, as are such evidences of erosion and sedimentation as the beginning of rills and gullies. Ground water characteristics and infiltration areas also may be observed.

Conservation patterns are particularly outstanding. Contour plowing and field strips, terraces and grassed waterways, shelterbelts and other tree plantings, farm ponds and wildlife areas, field ditches and tile lines which may be

indistinct, or even unnoticed, at ground level—all become amazingly distinct when viewed from the air. From an airplane, they command attention that lectures and surface field trips fail to do.

Another prominent feature of the rural landscape as seen from the air is the pattern of soils, especially in the spring before crops cover the ground. The dark colored depression soils stand out in sharp contrast to the lighter colored upland soils. Soil amendment and conservation needs, as they are related to crop appearances, become apparent from the air as the growing season progresses, as do the effects of soil erosion on the height and color of crops. There is less variation in color and height of crops on lands with good manage-



Dr. Ben Richason (l.) holds a pre-flight briefing for each group before an aerial field trip. To accommodate large groups of students or farmers, flights may include as many as 6 airplanes.

The author is professor of geography, Carroll College, Waukesha, Wis.

ment practices such as stripcropping and contour plowing.

The aerial vantage view accordingly can aid in farm surveys, and in planning field patterns and crop rotations. Crops such as corn, small grains, pasture and meadows, woodlots, and orchards, in addition to crop diseases, can be identified from the airplane at low altitudes.

In planning an aerial field trip for students or farmers, the selection of the proper type of aircraft is important. A light, four-passenger airplane with the wing above is most practicable because of its maximum visibility, greater maneuverability, and slower speed. Flying at about 1,500 feet provides the best identification.

Because the aerial field trip participants will be viewing land features from a new perspective, a pre-flight briefing session is held. As it is not possible to have an instructor accompany each flight, a field trip brochure and flight map are distributed in advance to the flying students. It also has been found essential that the pilots be briefed so they can point out points of interest. Students are encouraged to take their cameras along on aerial field tours, in order to

record more detail than can be obtained from aerial observations alone.

Post-flight interviews are illuminating in assessing the value of an aerial field trip as an instructional tool in geography and conservation. For example, one of the pilots who had flown the field trips many times said he had learned so much geography and conservation from the tours that he believed he could now "pass the professor's examinations."

SCS Work Unit Conservationist Charles W. Skaife reported receiving many requests for help in working out conservation farm plans following an aerial tour for farmers. He also found in such aerial observations a means of checking on the progress and maintenance of conservation programs. And Rolland Richards, farm management agent in Waukesha County, commented: "There is no better educational tool than the airplane to teach the cause, the effect, and the control of soil erosion, including water pollution and conservation practices."

Today, with the large number of available light airplanes, commercial pilots, and airports, aerial field

trips may be made by anyone interested in the maximum observation and study of good land use and conservation practices. Many grade schools, high schools, and colleges, as well as adult groups, have followed the pattern set by Carroll College's geography department by inaugurating aerial field trips as an effective teaching device.

Seeing and Reading About Conservation From the Air

Air travelers have a ringside seat for a spectacular show—a full sweep of the battle between conservation and waste being waged on the land below. They are witness to an ever unrolling panorama of conservation treated fields, farm ponds and watershed reservoirs, miles on end of tree windbreaks and farm woodlands, and lush pastures and rangelands dotted with cattle. Also sickly areas of eroding and wasting lands.

On one occasion a Soil Conservation Service employee, returning on Southern Airways to his Spartansburg, S. C., headquarters from a trip, was asked by the pilot, Capt. V. A. Knudegard, about the large number of farm ponds that could be seen from the air. Capt. Knudegard said he had counted more than 100 ponds during a 15-minute flight at 3,000 feet between Moultrie and Valdosta, Ga. The veteran pilot went on to say he would like to see the SCS prepare a booklet that would answer the questions travelers put to flight personnel about the jigsaw puzzle of conservation.

The upshot was "The Land Below Us," a 16-page illustrated publication designed to help air travelers interpret the dramatic story of what is happening to the land they are passing over. Two printings, totaling 10,000 copies, were used up in short order.

This interest in the unfolding scene below led to a second SCS bulletin in 1962, "That Land Down There," of which 310,000 copies have been printed.



Conservation farming scenes like this one are duplicated many times over in Wisconsin's farming country for those who take to the air to study them.



Whether seen from the ground or the air—from the family car, bus, train, or plane—today's conservation land is "Beautiful." New patterns on the land, shaped to Nature's likeness, give comforting assurance of the security of our land. (Top left to right):—Pa.—stripcropping; Wash.—contouring; Ga.—recreation; Ind.—watershed lake. (Center left to right):—Mich.—conservation land use; Minn.—contour stripcropping.

e Beautiful



andscape of farms and watersheds across the country underscores the inviting image of "America the f the Nation's productive soil and water resources as long as they are conserved and used wisely. (L. is.—tree windbreaks; Nebr.—contour bench leveling and irrigation; Nev.—good pasture; Md.—farm Mont.—wind stripercropping; Iowa—terracing and multiflora rose border.

Soil and Water Conservation Along the Main Line

By Herbert I. Jones

WHETHER they go overland by rail or highway or by air the Nation's travelers today are treated to the sight of an ever-broadening panorama of soil and water conservation measures spreading over farms and watersheds across the country.

This conservation work on land and streams helps in turn to protect rights-of-way, airfields, and other transportation facilities from erosion, flooding, and related hazards. And it thereby contributes to economy of operation by the carriers and to the safety, comfort, and enjoyment of the travelers.

Thus there are reasons enough why Americans on the move well may take a second look at such evidences of modern conservation planning and treatment as fields stripped with contour crop bands or terraces, thickly grassed pasture and range lands dotted with farm ponds or stockwater dams, tree windbreaks, alongside fields and farmsteads, floodwater-detention and recreational lakes or reservoirs on smaller streams threading the landscape, and other conservation measures.

For the railroad traveler—as for his counterpart journeying by bus or car—there is a significant story behind the scenes of conservation he sees from the window.

A hundred years ago, railroads were pushing westward in the wake of President Lincoln's signing of the first Pacific Railroad Act. Transportation and agriculture shared many common interests and problems during the century. As the railroads united West and

East, hauling produce of the land to market, and returning with supplies and more people anxious to fashion a new country, there was a concern for the land and water.

Historically, the railroads suffered from floods. Roadbed, rolling stock, equipment, and freight often were lost. Sometimes lives were lost, too.

Over the years, the railroads fought off floods by raising grades, increasing bridge spans, and building protective dikes and other structures; but there was little opportunity until recent years to do work upstream away from the tracks, on the creek-size watersheds out of which most of the damaging floodwaters spilled as more and more timber and grasslands were cleared and plowed or too heavily used by livestock. Exposed to

damage and delay, the railroads were in trouble at thousands of watershed crossings and wherever land use permitted problems to arise.

But today, at many of the same crossings, there is a different story, thanks in large measure to the development of soil and water conservation districts and watershed protection and flood prevention programs with Soil Conservation Service assistance. Railroads have furthered conservation practice over the years to help make this change possible. Their agricultural agents and livestock and development supervisors were ready to help, and recommended that their clientele work with soil conservation districts and watershed groups.

In some watershed projects



Railroaders, local citizens, and conservationists developing the White Clay-Brewery-Whiskey Creeks watershed project at Atchison, Kans., are seeking to prevent recurrence of scenes like this during the flood of 1958.

The author is field information specialist, Soil Conservation Service, Denver, Colo.



Views like this greet train travelers in the Tongue River small-watershed project area in northeastern North Dakota. The 125,000-cubic-yard earthfill Herzog Dam (foreground) is one of a series protecting 186 square miles of farmland served by the railroad.

where they derive direct benefits, railroads have played a major role by contributing financial aid, land, and services. In hundreds of other watersheds, railroads are gaining side benefits not anticipated during planning. The number of railroads affected by watershed conservation developments grows with nearly every plan reaching the construction stage. A few examples:

Passengers looking out windows of a main line Union Pacific Railroad train east of Topeka, Kans., may see only the broad productive bottom land cornfields; yet flooding of this land now is prevented by the Thompsonville watershed protection and flood prevention project work. Just out of sight are three dams and complete land treatment that together hold back or slow down excess runoff water. Farther upstream the Little Delaware-Mission Creeks and Nebo projects give added protection to this area.

Travelers on the Chicago, Rock Island, and Pacific Railroad get a close view of the Ramah Dam in Colorado's Big Sandy watershed project. This railroad provided land easements and maintenance money to further the work, which includes a 500-acre-foot recreation

pool, along with its flood prevention features.

Seattle-bound vacationers can get a glimpse of the meadow-valley lands of the Lower Willow Creek watershed project as the Northern Pacific Railroad train slips past Drummond, Mont. These are the first fields in the Nation to be irrigated with stored water made available in a Public Law 566 small-watershed project.

In South Dakota, trains now pass safely over a trestle that was

washed out five times in recent years. This is a benefit of the Silver Creek small-watershed project. On the Madden Arroyo watershed in Texas, Southern Pacific Railroad main lines were re-routed to allow construction of a principal dam and a more stable roadbed to assure passengers' greater safety and freight service no longer interrupted by washouts or high water. Thousands of people see this project work each week as they travel across the watershed area.

Conservation flood prevention work on Big Wewoka Creek in Oklahoma seeks to protect more than 50 railroad bridges and innumerable culverts crossed by the main-line trains between the head of the watershed and Wewoka Station. Floods on this creek cost seven lives and tied up trains for 2 weeks in 1945 alone.

The Chicago-Northwestern Railroad was an early participant in the Upper Salt-Swedeburg pilot watershed project in Nebraska. This is an outstanding example of effective conservation land treatment and upstream floodwater detention, with transportation carrier cooperation.

Two other types of conservation work catch the eye along railroad



Bench leveled irrigated fields (foreground), terraced dryland, a modern farmstead, and good windbreaks are close by the railroad tracks and highways in western Nebraska's Gering Valley watershed.

rights-of-way: One is wind erosion control—the strip crop patterns, tree windbreaks, and special sand dune stabilization work like that along the Atchison-Topeka and Santa Fe Railroad tracks near Lamar, Colo. Seen by hundreds of thousands of passengers, this work has been valued at more than \$1 million by the road and technical people who had a part in it.

The second kind are the jobs that

soil and water conservation districts and assisting Soil Conservation Service people also have done to regrade, regrass, and restore land to near its natural condition. An example is the view of the U.S. Air Force Academy grounds from the adjacent Denver and Rio Grande Western Railroad main line. A million visitors a year detrain and walk or drive into the Academy area, where they see what

has been done with grass, trees, diversion terraces, water-control structures, and other land-treatment measures and construction.

Wherever people go today, whether by train or other means of transportation, there's a lesson to be learned from the stories on the land that have been put there by conservation-conscious farmers and ranchers and cooperating community, business, and other interests.

Watershed Project Brings Flood-Free Highway

By Gordon S. Smith

A FLOOD-FREE highway plus new recreation facilities and several hundred acres of improved farmland are among the community benefits packed into New Hampshire's 15-square-mile Oliverian Brook small-watershed project. The watershed protection and flood prevention project, in which the structural work has been completed, resulted from long-range planning by local people, augmented by State and Federal technical help and cost-sharing.

The Oliverian, in the northern part of the State, drains a 9,860-acre watershed above East Haverhill, a Grafton County village. Meandering out of the White Mountain National Forest, it falls over rocky ledges and flows through inviting trout pools and past fertile bottom land farms on its way to the Connecticut River. But in the past its peaceful waters too often turned to destructive floods when snows melted fast or a thunderstorm hit the area.

Farmers in the narrow valley bore the brunt of these floods for decades. Their fields were under

water several times a year, and crop losses were ruining profits.

Farmland flooding wasn't the only problem. Each flood also swamped State Highway No. 25, vital link to other New England points, which ran through the valley. Local and interstate traffic had to detour 10 miles for days at a time; and continual road patch-

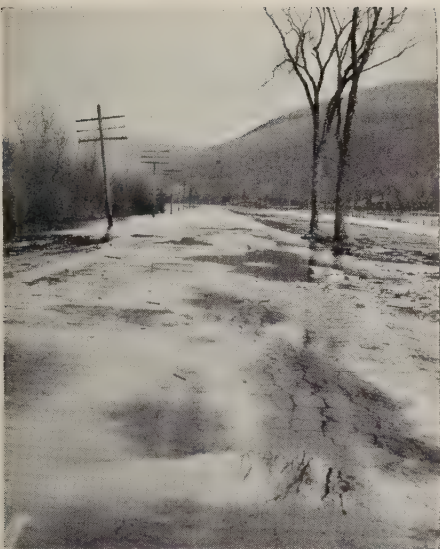
ing and backfilling ate up thousands of tax dollars and made driving hazardous.

In the search of relief, landowners turned to supervisors of the Grafton County Soil Conservation District. Their united efforts launched one of New England's first small-watershed projects. The Soil Conservation Service helped



Here is the completed Oliverian Brook watershed development, looking downstream from the new flood prevention dam (right foreground). New Highway No. 25 passes to left of dam.

The author is field information specialist, Soil Conservation Service, Upper Darby, Pa.



Route No. 25 was flooded frequently and in continuous need of repair before the watershed project gave it protection.

local people plan the project and supervised structural improvements, which the district will continue to operate and maintain.

One is a floodwater-retarding dam in the upper half of the watershed, to hold back excess runoff from 70 percent of the watershed. The other is an improved stream channel at the lower end of the watershed, to keep water from gathering in the flat farmland area.

Upland conservation, an important factor in small-watershed planning, was good, with the Oliverian hills 94 percent tree-covered—7,000 acres in well-managed National Forest land and the rest in grassland and farm woodlots.

When SCS engineers found the only suitable site for the new dam passed directly across Route 25, New Hampshire's Department of Public Works and Highways relocated 2.8 miles of the road, and thereby turned an obstacle to advantage. Instead of hugging the stream, the new stretch climbed up and around the damsite.

New Hampshire Highway Department engineers figure a savings of \$35,000 on highway construction costs because of the watershed project. The dam reduced the road flood hazard almost to zero.

The watershed dam proved its value when it was only 75 percent finished. When a typical spring deluge hit the area, 8 feet of potential floodwater backed up harmlessly behind the dam. Previously, there would have been another episode of 350 acres of flood-soaked farmland and highways awash. Three miles of channel improve-



This is the new highway stretch close up. SCS technician Everett Henson checks roadbank stabilization grass seeding.

ment below the dam now gives added protection.

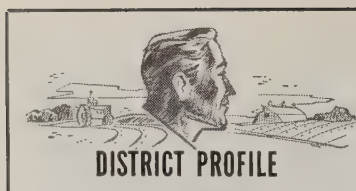
The watershed project offers multiple recreational returns. The Forest Service is enlarging a park in the newly protected area. Facilities for picnicking and camping will be more than doubled. The old roadbed, now passing underwater at the edge of the lake, will be the base for a ramp for rowboats and canoes. The new lake holds good promise for trout fishermen, and stream fishing will be better than ever. Waterfowl already are making use of the new habitat.

Flood-free Oliverian farmers report, meanwhile, that their hay crops have doubled. Land can be worked 2 to 3 weeks earlier than before, because equipment doesn't bog down in soggy fields. And daily milk deliveries are sure of getting to town on time over the new highway—no matter what the weather.

"Beyond all these local advantages," says SCS Technician Don Ferren, "this project has shown surrounding communities the advantages and benefits offered in watershed protection. Several applications for watershed projects already have stemmed from this project."



This flood plain grassland below the new dam is now protected from floods.



District Officer— Commercial Pilot

CAPTAIN Rolland L. Graves of Colorado is thought to be the only man in the Nation serving on a soil conservation district board who is also a commercial airline pilot. As a member of the district Board of Appeals, he serves as an auxiliary member of the board of supervisors.

He brings a world of experience to both his jobs. Graves has more than 20 years to his credit at the controls for Continental Airlines. Before that—boyhood on a Colorado farm, and years as flying instructor in Kansas and Wyoming.

It takes Graves 20 minutes to drive from his 80-acre irrigated farm to the Denver airport. And a jet trip may have him back home in 6 hours. When he leaves his crops and cattle, he may go to El Paso, Los Angeles, or Chicago; but wherever it is, he takes his lively interest in agriculture and curiosity about the land with him.

"One real kick I get out of flying," Graves says, "is seeing the changing land patterns, the farming plans developing each year, and the differences management and conservation make. The watershed work is a sight to see. I've watched the job on our Cherry Creek grow, and I'm proud to think my district has played a part."

In 1946 Graves bought his farm, installed wife Sandy and six children, rented an adjoining 240 acres, and settled down to a life of country living. But there were too many things to do to rest long. Fields needed leveling, irrigation ditches and water supplies required improvement, and new facilities had to be built. That's when Graves became a cooperator with

the West Arapahoe Soil Conservation District—the step that led to his board duties 3 years ago.

Recently, Graves and the rest of the District people have faced up to the problem of metropolitan expansion. The Graves place and many other farms have changed



Capt. Rolland L. Graves.

from a strictly rural setting into a rural complex, with all of its pressing land and water problems. The West Arapahoe district leaders are alert to these changes and are again revising their programs and plans, with the help of the Soil Conservation Service.

The district board and a special nonprofit educational corporation have created the Plains Conservation Center on three sections of prairie land owned by the district, and are sponsoring teachers' and students' scholarships to inform city people about farm and ranch problems and to develop conservation concepts among the 100,000 school-age youngsters in the area.

The district board has hired its own educational leader to further these aims.

Crew members teaming up with Captain Graves on his flights are subjected to some conservation teaching by this unusual district official, while their passengers, in common with those of other air lines, may read about the conservation patterns below in the Soil Conservation Service publication, "That Land Down There," available on board.

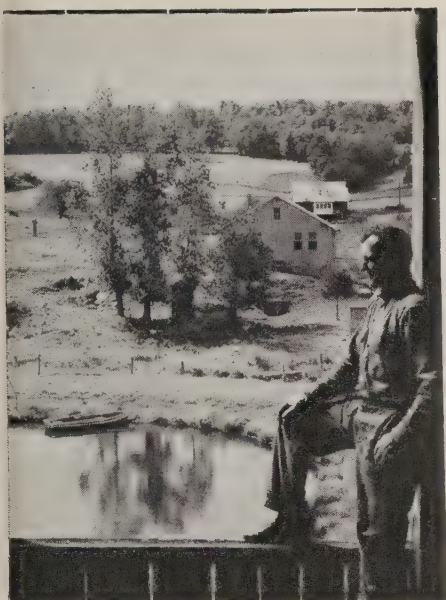
Recalling his interest in historic pioneer trails, settlements, and mines, he points out the ease with which these can be identified from the air and how they can be interpreted in terms of land, soils, and water. He also likes to talk about the land-use patterns he sees from the air: Stubble mulching on grain lands, conservation range use in many areas and others that need regrassing, reservoirs when they are filling and the watershed snow pack, and communities which are using contouring, terracing, and strip farming. Also, the border diking and pre-irrigation in New Mexico, spring irrigation patterns in Nebraska, the encroaching wind erosion designs adjacent to blow fields, and the fantastic patterns of water erosion.

So it is that District Board Member Graves, who spends a good part of each week airborne, is able to sum up from the thousands of quick glances a commercial pilot takes along his route the needs for conservation and the healing and beautifying aspects of soil and water conservation on the land below.

—HERBERT I. JONES

BY ACCIDENT AND BY DESIGN

By William W. Nace



Foster Yost talks better about conservation when he takes you up in the barn overlooking the pond, farmstead, and contour strips beyond.—Missing is Mrs. Yost fishing from the boat!

ACCIDENT is a western Maryland town which owes its name to just that—an accident. An accident of early-day land settlement, that is.

The original grantee back in the 18th century may not have thought too highly of this mountain area's potential, but today's residents along the pleasant valley through which runs U. S. Highway 219 to connect the Pennsylvania Turnpike with the West Virginia mountain country find it increasingly rewarding in farming, recreation, and satisfying living far removed from urban sprawls and "strip cities." No accident is the impressive concentration of soil and water conservation measures that visitors and travelers on the highway see extending up the slopes both directions from the town of Accident.

Adding to Garrett County's rural beauty are the working patterns designed by farmers striving for better land use through conservation farming. The same patterns, visible for long distances from the ridges and valleys, extend

for miles elsewhere over the county—between Oakland, the county seat, and popular Deep Creek Lake that backs up 30-odd miles behind a 90-foot-high dam as part of the Pittsburgh electric power system; southward along State Highway 560 running through Mountain Lake to Virginia; and northward from Oakland through the Little Youghiogheny River watershed, in which two watershed protection and flood prevention project dams have been completed so far. One may be seen from the highway 4 miles north of Oakland. The other completed flood-prevention-recreational reservoir comes to within a couple of hundred yards of the Baltimore and Ohio Railroad's St. Louis-Washington line about 6 miles east of Oakland at Deer Park and may be seen on the left from trains traveling west. Two others nearby will take shape this summer.

Accident inherited its name by a trick of fate almost 2 centuries ago. King George II, in 1751, granted 600 acres of colony land, to be located in the western part of the colony of Maryland, to a George Deakins in payment of a debt; but Deakins evidently didn't value his grant too highly and never attempted to stake out his claim.

After Deakins' son, William, inherited the unlocated land in 1774, however, he dispatched two survey parties to select his 600-acre tract. Neither group knew of the other. By chance, the second survey party came upon Deakins' first survey party. Comparing notes, orders, and reference marks, the two parties found they were on the same mission and had, by accident, marked the same area out of all that wilderness. The tract thus was patented, with the name "Accident," to William Deakins in



Contour stripcropping, farm ponds, improved grasslands and woodlands form this striking aerial pattern of conservation land use on at least 16 farms around Accident, Md., (upper left).

The author is work unit conservationist Soil Conservation Service, Oakland, Md.

August 1774.

Ensuing generations of timber clearing and farming brought their soil erosion and related problems. By World War II they were bad. One farmer and community leader, Foster Yost of Accident, is credited with having been largely responsible for the change from old-fashioned, soil-wasting farming in the valley; but when the Soil Conservation Service recommended contour stripcropping to help tie down the soil, even he was not convinced that anything but straight rows would be practical.

It was arranged for Mr. Yost and a carload of his neighbors to visit conservation farms in Frederick County, Md., to see contour

strips and talk with farmers who used them. Yost returned home convinced. He plowed his cropland in contour strips that spring and built two long diversions to help carry excess rainwater off of his cropland.

Yost's reputation as a good farmer likewise convinced his neighbors that these new farming ideas were sound. They soon followed his example. Yost became a supervisor of the Garrett County Soil Conservation District when it was formed by landowners in 1943, and served as chairman from 1945 to 1960.

Today, Accident is a thriving dairy and beef cattle center, which relies heavily on soil and water-

saving practices to keep it so. Farm ponds dot the land. One large community pond supplies emergency water for the local volunteer fire company and recreation for the village. Also attesting to the progress of conservation farming in this locality of generally small non-woodland farming operations are the several hundred acres of contour strips, diversions that carry water safely off hillside fields, and steep land now protected by trees.

Driving past the sales barn on Route 219 just below Accident during a regular Monday auction, which draws livestock buyers from a distance, any passerby can see that farming in Accident is a good business—and it's not by accident!

From Watershed Dam To "Country Club"

By Raymond C. McBay

A recreational area on the D. E. Billups farm near Van Alstyne, Tex., is a working example of turning a watershed protection and flood prevention development into a supplemental community asset.

The now popular Mantua Country Club was built at one of the 253 floodwater-retarding structures planned by the Soil Conservation Service for construction in the Collin Soil Conservation District, as part of the Trinity River watershed in Collin, Fannin, and Grayson counties. Plans for the recreational facilities were started upon completion of the 29-acre lake, with Federal technical and financial assistance, in October 1958.

Billups designated 8 acres of waterfront land solely for the pur-



Watershed dam that forms lake.

pose of recreation. This area is used for picnicking, camping, volleyball, softball, and croquet. The lake supplies fishing, boating, skiing, and swimming.

With the cooperation of the Grayson-Collin Electric Cooperative, foundation poles were installed for a 200-foot fishing pier

and a diving platform in the swimming area. Seventeen floodlights were mounted on discarded poles, to light the swimming, camping, fishing, picnic, and croquet court areas.

A club house and concession stand was built in 1962 and is available for special gatherings and parties, for a small rental fee. Several tables and barbecue grills also are available for picnicking and camping. Water supply for the recreation area is supplied by a fresh-water well. Two rafts were placed in the roped-off swimming area. For the fishermen, a barge powered by a 15 hp motor accommodates 10 to 15 adults. Swinging bridges across the prongs of the lake give access to more shoreline.

"The cost of all existing facilities is about \$1,500," Billups said, pointing out that low cost was made possible by the help and

Note:—The author is work unit conservationist, Soil Conservation Service, Van Alstyne, Tex.



Entrance to Mantua Country Club lake with some of recreation facilities in background.

cooperation of others. Improvements and maintenance are financed by annual membership dues.

Twelve to fifteen hundred people are now enjoying the recreational facilities at this lake each year. Annual family memberships exceed

100. Members come from all surrounding towns, including the City of Dallas, Richardson, Plano, Garland, McKinney, Celina, Allen, and Van Alstyne. Honorary memberships are presented to ministers of all churches, and the facilities also are made available to

other nonprofit organizations such as Boy Scouts, Girl Scouts, 4-H Clubs, and others seeking outdoor recreation and training.

Billups said that future membership dues will be used to improve the area further. Some of the improvements planned include the control of undesirable water plants, cleaning of the shoreline, and the building of minnow ponds to provide bait for the fishermen.

Conservation Air Tour Draws Arkansas Visitors

Nineteen sixty-three marks the sixth year that supervisors of the Jefferson County (Ark.) Soil Conservation District have sponsored an annual conservation air tour.

About 150 people from Pine Bluff and the surrounding area go on the tour, first held in 1958. Flights leave the airport every 30 minutes from 9 a.m. to 4 p.m. Four-place planes, flown by experienced local pilots, are used. For \$3 each, people are taken on a 60-mile tour "as the crow flies," and given a bird's-eye view of conservation practices being carried out by Jefferson County SCD cooperators. About 15 points of interest are marked by squares of heavy white paper easily seen from the air. In addition, each individual receives an illustrated folder showing the route to be flown and identifying and describing the practices to be seen.

Besides local people, visitors from all over Arkansas have made the tour.

Have You Seen?---

● "Outdoor Recreation on the Nation's Farmland," published by the U.S.D.A. Office of Information as Picture Story 140. Mostly by pictures, this pamphlet shows how many farmers and other landowners already have found recreation to be a new and profitable "farm crop."



200-foot pier makes fishing easier in the Billups lake.

Soil Surveys Help Engineers Build Better Roads at Lower Cost

By Louis E. Derr

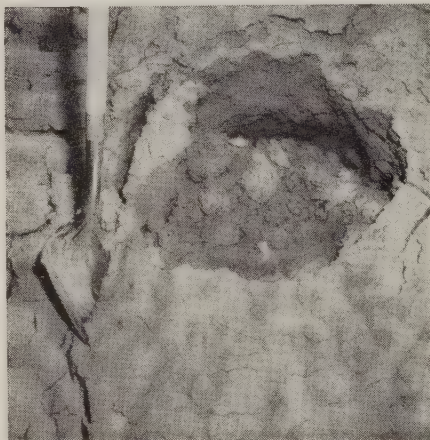
SKILLS of the soil scientists are figuring more and more in the decisions of the engineers who route or design and build modern highway systems. Substantial savings in construction costs and greater durability of the roads are among the measurable benefits.

In Oklahoma, to illustrate, the use of information contained in present published soil surveys is regarded by highway engineers as a prerequisite to beginning each new job. For one thing, the soil surveys published by the Soil Conservation Service in Oklahoma, as in other States, have engineering sections which have been prepared with the cooperation of the Oklahoma Highway Department and checked, on a selected sample basis, in the laboratories of the U. S. Bureau of Public Roads in Washington. The soils of 30 Oklahoma counties, representing more than half the State's area, have been surveyed by the SCS in cooperation with the State Experiment Station and survey maps useful to the highway builders published.

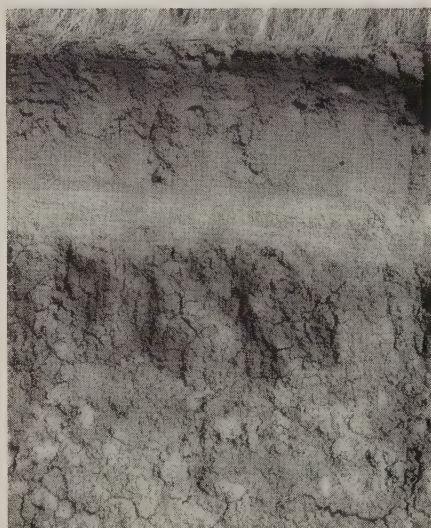
This progress may be credited mainly to the efforts of R. A. Helmer, research engineer for the Oklahoma Highway Department. For years he has maintained among his contemporaries that soils information, as provided by the soil survey, is fundamental in the routing and building of highways that are to perform satisfactorily and endure.

On one occasion, for example,

Helmer described before the Highway Research Board in Washington how information such as is now available in a soil survey re-



Cave-ins like this on unstable soil are caused when oversaturated soil underneath is tunneled away. This action results in damage to highways unless excess water is piped out.



Soil profile of Parsons silt loam in Oklahoma showing heavy clay subsoil (bottom) that shrinks and swells and causes pavement damage.

port could have meant a \$600,000 saving in the paving cost alone of U. S. Highway 70 in southern Oklahoma. The highway crossing Choctaw County is routed over stretches of clay soils which have a high "shrink-swell" characteristic. Paving on this type of soil presents problems well known to the highway engineer.

A 13-mile stretch of Highway 70 is on sandy loam soils. It takes an average of 15 inches of base and subbase for a highway on such soils, according to engineers' calculations. The remaining 32 miles of the road is on plastic clay soils, which require an average of 26 inches of base and subbase, 11 inches more than on the sandy soils. The county soil survey, made years after Highway 70 was built, showed that routing the highway not more than 1 mile away would have skirted the clay soils and would have placed it on the more stable sandy loam.

"By 1950 prices, an inch of paving cost about \$1,800 a mile," Helmer pointed out. "Eleven times \$1,800, for the 32 miles of Highway 70 built on the clay soils, figures out to be more than \$600,000."

Through Helmer's efforts, available soils information has been prepared and systematized for the use of the engineers and others confronted by problems of excavation and foundation.

Another useful source of soils information for the State's highway builders is the "strip surveys" being prepared by the SCS soil scientists through agreement with the Oklahoma Highway Depart-

The author is State soil scientist, Soil Conservation Service, Stillwater, Okla.

ment. These surveys, in more than usual detail, are made along the routes of present roads to provide information essential in the development of new highways. The functioning of the present roads in the light of the soils information is subjected to intensive research.

Oklahoma's broad surface has many areas in which the work of the soil scientists, in field and laboratory, can mean much in time and expense saved by the engineering profession. And in another 6 years, according to the schedule of the soil survey in Oklahoma, the soils of the entire State will have been mapped and the information made available to all who have need of it.



Roadside erosion control like this in Texas also prolongs highway life, protects adjacent farmland, and contributes to safe travel by automobile, bus, or truck.

Audubon Classes Travel To Conservation-Nature Areas

By Georgie A. Keller

AS urbanization encroaches more and more on agricultural and natural areas and urban areas continue to spread city people are finding it harder to reach open countryside where they can study and enjoy conservation and natural history at first hand.

To help meet this challenge, the Audubon Society of the Central Atlantic States, Inc., through the U. S. Department of Agriculture's Graduate School, conducts a 2-year series of adult courses that provide an understanding of the ecology of this region. The main idea behind the courses is to get the students out in the field and on the land.

All-day and overnight trips are conducted by specialists of the Soil Conservation Service, U. S. Geological Survey, U. S. Weather Bureau, and Bureau of Sport Fisheries and Wildlife, and by university and high school teachers. Stu-

dents and instructors travel over main highways and country roads to the natural regions in Maryland and Virginia. En route, they observe conservation land-treatment measures and visit and study the natural history areas.

An elementary course for those

with little outdoor experience introduces them to the out of doors, with the option of making overnight camping trips. For example, after being exposed to the rudiments of practical dress and equipment for outdoor life, and to the many reference books and field



Soil and water conservation scenes like this one hold a particular interest for the traveling students.

The author is assistant to the editor, *Soil Conservation* magazine, Soil Conservation Service, Washington, D. C.

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identification guides, car caravans of students and teachers leave Washington for the Cedarville State Forest in Maryland, off of U. S. Highway 301. There they study the geologic formation, the trees and other vegetation, and wildlife. They are shown the A, B, and C horizons of a soil profile exposed along one of the trails, and abandoned farmland that is reverting to forest land because it is in the area of the podzolic soil group.

Another day, the caravan swings along State Highway 416 and stops near the intersection of State Highway 4 to visit the Patuxent River marsh. The students examine the wild rice growing in the fresh tidal river part of the marsh, note the transition from cattails and reedgrass to the big cordgrass in the brackish tidal river section, and identify aquatic plants common to both.

In addition to having esthetic value, marshlands yield commercial products such as furs, wildrice, peat, rushes, and hay. In fact, Soil Conservation Service biologists say proper marsh management is becoming more and more urgent for continued production of fur-bearers and waterfowl. Practices used in SCS planning for marsh management include controlled burning and water leveling.

Visiting the uplands en route to the Catoctin Mountain Park near Thurmont, Md., the Audubon Society students observe many ex-



A few of the Audubon students take a break on field trip.



An SCS trial planting of American beachgrass.

amples of improved pastures, grassed waterways, contour strip-cropping, and other soil and water conservation along Interstate Highway 70 (U. S. Highway 240) and U. S. Highway 15 and State Highway 77. On another trip, the caravan takes U. S. 50 and State Highways 16 and 335 to the Blackwater

National Wildlife Refuge near Cambridge, Md. There the students see fresh-water impoundments and land between them producing food crops for the wildlife that abounds in the refuge.

One of the most productive trips of all is the overnight journey to Ocean City, Md. Here the students study beach erosion, accentuated by the damaging March 1962 storms; see dunes in the slow process of stabilization by native beachgrasses; and examine marine life cast up by the ocean. The SCS, in the meantime, has made trial plantings of both European and improved strains of American beachgrass in the Ocean City-Rehoboth Beach (Del.) area; and supplies of the superior American species for general planting now are being produced by growers from initial stocks made available to soil conservation districts by the SCS Plant Materials Center at Beltsville, Md.

At a nearby salt marsh, the traveling students also study the transition zones from upland vegetation, to shallow-water vegetation, to deeper water vegetation.

Thus the natural history field school covers representative examples of all the major ecological communities in the Central Atlantic region, and gives its participants from the city an otherwise hard-to-come-by opportunity for learning to understand more about conservation and natural history.

JULY 1963

Soil Conservation



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Soil Conservation 25 Years Ago

“Agricultural land-use programs must look beyond agriculture. They must consider all land uses; those that employ the city workers directly and indirectly as well as those that employ the people on the farms. Agricultural land policy cannot be bounded by the farms, ranches, and forests, or even by the rural population; it should formulate alternative programs, one for the possibility that industrial revival will shortly restore the movement of population away from the farms and toward the cities, and another for the possibility that it will not. In the first case land not suited to farming can be shifted readily, as funds and other facilities permit, to forest, recreation, and wildlife purposes. In the second case, the shifting will meet with considerable resistance and will need to be coupled with relocation programs and with special programs for relatively non-commercial agriculture. Agriculture is not in a position to solve industry's problem; but it cannot deal with the farmland problem without reference to urban conditions.”



COVER PICTURE—This contour strip-cropping and sod waterway on C. J. Cavalier & Son Farm, Martinsburg, W. Va., is typical of conservation measures to be seen any July throughout the country. Photo by James H. Conklyn.

Soil Conservation

ORVILLE L. FREEMAN
Secretary of Agriculture

DONALD A. WILLIAMS
Administrator, Soil Conservation Service

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FRANK B. HARPER, Editor

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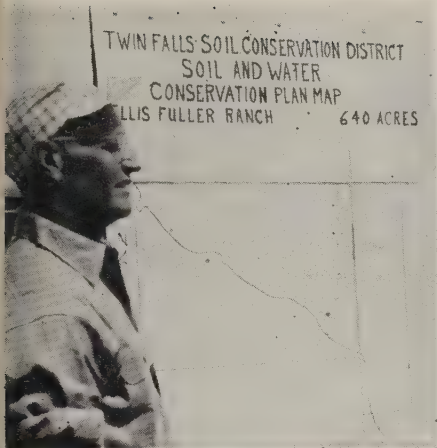
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Conservation Program Makes Idaho Ranch Pay

By Clarence Hedrick



Ellis Fuller explains conservation ranch plan during annual SCD tour.

A COMPLETE soil and water conservation plan enabled Idaho rancher Ellis Fuller to take a depleted 640-acre ranch and develop it in 10 years into a well balanced economic ranch enterprise that shows a profit even in the most severe drought years.

Following World War II, Fuller rented 200 acres of farmland near Twin Falls. Since that time, he has purchased this land and an additional 440 acres of adjacent dry grazing land.

From 1945 to 1952, Fuller ran 12 head of cattle on the 640-acre unit. He cropped 200 acres, all of which was irrigated. Crops were beans, peas, and alfalfa-hay. Beans and peas totaled about 160 of the 200 acres.

Fuller's operation was complicated because his ranch is in an area where there is a shortage of irrigation water 8 out of every 10 years. The irrigation system on the ranch needed revision. All irrigation runs were at least $\frac{1}{4}$ mile long, and water losses were excessive. Fuller says that from 1945 to 1952 his farming operation was poor, and that if he hadn't done custom work away from his ranch he would not still be in the ranching business.

In 1952 when the Twin Falls Soil Conservation District pro-

gram was brought to Fuller's attention, he developed a complete soil and water conservation ranch plan with the help of the Soil Conservation Service. The main object of this plan was to treat each acre of land according to its capability, obtain maximum efficiency from available irrigation water, increase soil fertility, lower production costs, and bring about a more stable ranch enterprise.

The first step was to make a complete appraisal of soil, water, and plant resources. Irrigation water records, soil, land capability, range site and condition, and engineering surveys were used.

To make most efficient use of available irrigation water, the plan called for a completely revised irrigation system. Irrigation runs were reduced in length from $\frac{1}{4}$ mile to 680 feet. Concrete pipelines, lined ditches, water-control structures, and land-leveling practices were installed according to

engineering design and specifications. An additional 30 acres of land is now being irrigated.

To boost soil fertility it was planned to increase the acreage of soil-building crops and decrease the soil-depleting crops. This was accomplished by increasing the acreage of alfalfa-grass hay. Irrigated pasture and grass for seed production replaced some cash crop acres such as beans and peas.

The next step planned was the improvement of all rangelands. To accomplish this it was necessary to eradicate sagebrush and annual weeds, prepare a seedbed, and seed adapted dryland range grass on all rangelands. Water for livestock had to be developed and each unit fenced, so a rotational deferred grazing schedule could be followed.

About 80 percent of all conservation practices planned by Fuller in 1952 have been applied. He is now running about 110 head of



Cattle grazing one of Fuller's rangeland units.

The author is work unit conservationist, Soil Conservation Service, Twin Falls, Idaho.



Concrete-lined ditch and siphon tubes in revised irrigation system.



Alfalfa-grass hay ready to be stacked for winter feeding.

Angus cattle, with year around forage. Cash crops of beans and peas have been reduced by 30 to 40

acres. Grass for seed production and irrigated pasture has been put on lands previously used for cash

crops. His ranch is known as a show place of a complete soil and water conservation program in action.

Watershed Dams Provide Better County Roadways

By C. W. Chapman

STEPHENS County, Ga., officials figure the county saved money when it paid for widening watershed dams in order to route a county road over them.

"We don't ask why, any more; we just want to know how," Chairman Willie G. Sheriff of the County Board of Commissioners explained in talking about work on two Broad River watershed projects.

Road work on the North Fork of Broad River watershed, the pilot project, is nearly complete. Similar work is getting well under way on the North Broad River watershed, a watershed protection and flood prevention project authorized for operations 2 years ago.

The programs are similar, includ-



Commissioner Sheriff still likes to take a turn on the tractor.

ing the cooperation between the Federal and county governments and the local people. In every case, the new road has been shorter, straighter, and safer for the public to travel. Bridges have been eliminated that, with their approaches in the valleys, had been subject to frequent damage by floods, with resultant high maintenance costs.

"With the new dams they are safe from flooding, no bridges have to be replaced, and none of the road is in the 'swamps,' so we reduce maintenance costs," Sheriff added. "More maintenance money is saved by vegetative protection given the shoulders of the roads and the back slopes under the watershed program."

The author is State conservationist, Soil Conservation Service, Athens, Ga.

In one case, the county built a higher road bed to permit the construction of a flood-detention reservoir. Last year, the county furnished labor and equipment to plant grasses and lespedeza on the roadbanks of nearly 50 miles of county roads. This outlay represented at least 50 percent of the cost. The watershed program supplied the seed and fertilizer.

Sheriff is a farmer and a businessman. He owns land in the watershed, and is an earthmoving contractor.

"I have become so conscious of erosion that I never let a new construction job—either county or private—lie bare any longer than necessary," he said. "As soon as we shape a new road, or reshape an old one, we plant grass. When we come back later to lay the blacktop we may destroy some of the grass and have to replant. But the expense is not great, and the protection we get is worth the cost."

Almost all of the landowners cooperate. The work done on private farms is the basic part of the program. Farmers plant trees and grass, heal gullies, put conservation practices on their lands, and give the right to use whatever land is needed for flood-detention reservoirs, channel improvement, or roadside protection.

"Only kudzu can control erosion on the high, vertical banks, but it is objectionable to many people," Commissioner Sheriff pointed out. "In many cases, they set their fences back so we can slope the roadbanks and use the better kinds of grasses and legumes."

"Our people take a great pride in their communities, including the appearance of the roadsides. I think it is at least partly due to the great improvements made on the pilot watershed since work began in 1955. When the appearance of one community is improved by road work, other groups ask for the same help. I think the women have a lot to do with that. Perhaps they notice the things that beautify



Roadside gullies caused by years of waterflow from adjacent cultivated field.



3-year-old kudzu and lovegrass healing the gullies.

their communities more than the men do."

Sheriff said there is now so much demand for road improvement that he can select his jobs where the people are willing to give enough right-of-way for proper bank sloping.

"Where there are holdouts, we just wait for the community spirit to act," he said. "Then when everyone is ready to help do a good job, we put that community road on the schedule. We don't need to condemn right-of-way for county roads. We never lack for oppor-

tunities to do first-class road jobs.

"This county has learned that we get nothing but benefits from the watershed program. We get planning and technical help from the Soil Conservation Service, and through their small-watershed programs we get much financial help.

"Their programs have proved themselves in the control of erosion, in the reduction of sediment and flood damage, in the reclamation of fertile bottom lands, and in the resulting improvement in the economy—as well as the beauty—of the county."

Great Plains Program

Drought-Proofs Ranch

By Walter N. Parmeter

COOPERATOR Walter Dennis in the Jackson-Washabaugh Soil and Water Conservation District in South Dakota credits his ranching success to his Great Plains Conservation Program.

"My conservation plan under the Great Plains Program drought-proofed my 'Target Ranch,'" is the way he puts it.

The "Target Ranch" got its name because of a large target Dennis hung below his registered Hereford sign alongside the road so those who must shoot at signs will use the target instead.

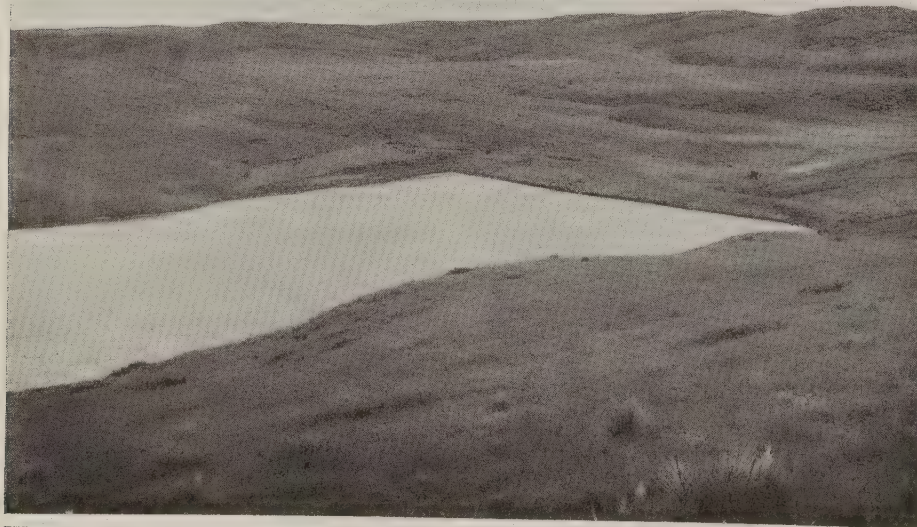
The Dennises not only run some 260 head of registered Hereford cattle, but also raise registered quarter horses. Dennis, a tall soft-



Walter Dennis points out how marksmen have used his target and spared his ranch sign.



Registered Hereford cattle fatten on Dennis' good grass.



Water at the dam end of this water-spreading storage reservoir is 23 feet deep. Full reservoir provides 90 hours of irrigation.

spoken rancher from Sansaba in central Texas, has not bought feed for his livestock during the past 2 years, and has had ample carry-over to last for two seasons.

Soil Conservation Service technicians assisting the Jackson-Washabaugh district helped him develop his conservation plan, which now consists of two water-spreading systems on the first bench of the White River, 18 stockwater dams, 2 stockwater wells—1 equipped with electric pump—2 large dams for water spreading, and 2 floodwater-detention dams.

Of the 5,600 acres in the Dennis ranch, 4,000 acres are in one watershed. In 1957, before the Great Plains program was started, 130 acres of hay were cut on the White River bottom. A rainstorm in this large watershed sent enough water over the bottom to wash this complete crop down the river. Because of the frequent droughts, hay crops were often short, and Dennis had to buy hay when there wasn't any hay for sale in the county.

"With my Great Plains conservation ranch plan in operation," he said, "I now have as much as 300 tons of hay carry-over.

"The water in the large watershed is impounded each spring, and in late October or early November I open the 15-inch gate in this dam

The author is conservation agronomist, Soil Conservation Service, Huron, S. Dak.

and irrigate my native grass and alfalfa on the 130 acres of bottom land through a water-spreading system. When the reservoir is full, I have 23 feet of water in the dam, and it backs up in the valley $\frac{1}{4}$ to $\frac{1}{2}$ a mile. It takes 90 hours of steady irrigation to empty the system in the fall."

The native hay on the bottom is composed of western wheatgrass, green needlegrass, prairie sandreed, some switchgrass, and big bluestem. The production on this bottom land was increased by drill-

ing in 10 pounds of Ladak alfalfa an acre in the spring as soon as it was dry enough to use a drill.

Under his Great Plains plan, 400 acres of Dennis' rangeland was scheduled to be reseeded; but when it was deferred from grazing, it made such rapid improvement that it now appears reseeding will be unnecessary. All of the rangeland now has proper range use, and most of it is in excellent condition.

Dennis also practices rotational deferment grazing with nine large pastures and 14 miles of cross

fence—out of a total of 26 miles of fence on his place. These cross fences give him 15 pastures ranging from 40 to 1,350 acres. Each pasture has stockwater, salt, and one or more oiling systems to control livestock flies.

"Operating under a Great Plains conservation plan, my whole ranch has a new value," Dennis says. "If the upland is worth \$30 an acre, the hay bottom with the spreader systems is worth \$300 to \$500 an acre. Under this system, I feel secure in the years to come."

Conservation on Defense Lands

By Ella P. Wilkin

THE Departments of Defense and Agriculture will work together for the conservation of forest and soil and water resources on lands administered by the Department of Defense under an agreement signed by Secretary of Defense Robert S. McNamara and Secretary of Agriculture Orville L. Freeman.

The U. S. Department of Agriculture will cooperate in the development and furtherance of Department of Defense conservation programs at military installations, reservoir projects, and other facilities. The Defense Department will have available to it, through USDA's Forest Service, Soil Conservation Service, and Agricultural Research Service, technical assistance, advice, and special research needed in determining suitability of soils for special uses and in applying conservation measures on its lands. The Department of Defense will reciprocate by providing services and facilities useful to the USDA agencies.

Secretary Freeman said in sign-

ing the agreement at the Pentagon, Washington, D. C., on March 27, 1963:

"This agreement will provide better conservation of natural resources as well as a savings to the taxpayers. The military will continue to help us in fighting forest

fires and providing us with their aerial maps for a wide variety of survey purposes. We will reciprocate by providing technical assistance to conserve soil and water resources on public lands administered by Defense. I believe our technicians can provide a highly



Secretary of Defense McNamara looks on as Secretary of Agriculture Freeman signs conservation agreement.

necessary service which otherwise would require hiring special personnel for the job."

Secretary McNamara pointed out that the agreement "recognizes the close working relationship of our

two Departments and the vital need for conservation of our forest, vegetative cover, soil, water, and related natural resources to meet the needs of future generations on lands entrusted to our care."

"Natural resources are not only vital to the welfare of the American people," he added, "but their conservation and wise use is an important part of our national security."

Conservation Safeguards

Historic Pepper Fields

By Leon J. Sisk

AVERY ISLAND in the heart of the Louisiana Evangeline country combines fairyland beauty with 20th century industry but is most widely known for the production of tabasco sauce from peppers grown on the lowland that forms the perimeter of this "Wonder Island."

Industry-wise, it is the site of the oldest salt mine in the Western world and of a producing oil field. On the esthetic side are Bird City and Jungle Garden, both the creation of the late Edward Avery "M'sieu Ned" McIlhenny, descendant of John Marsh, the original grantee of Avery Island in 1703.

About the turn of the century when the snowy egret was nearing extinction from being slaughtered to provide plumes for women's hats, M'sieu Ned got legislation passed protecting the egret, and then created a nesting sanctuary on the island that formed the nucleus of a colony which today numbers more than 100,000 of these birds. He also collected rare plants and shrubs from all over the world,

which went into the island's fabulous Jungle Garden.

"We have to grow pepper on this lowland," President Walter McIlhenny of the producing company says, "because the interior of the island is too rough. Also it is our belief that the land where we are growing pepper produces pepper of better quality and better flavor. The variety of pepper from which tabasco sauce is made was developed on Avery Island and has been grown on the same fields for

longer than 100 years. If we allowed the pepper fields to be destroyed we'd be in a serious predicament. Soil conservation is our insurance against that happening."

Only 12 miles from the Gulf of Mexico, and surrounded by swamp and marsh, Avery Island actually is a geological formation known as a salt dome, thrust up for some 150 feet above the surrounding area. The dome is reported to extend to a depth of 8 to 10 miles. Nearly 2,000 acres above sea level



Pepper growing in strips between terraces that empty into grassed waterway, with section of a "deer gap" left of fence.

The author is field information specialist, Soil Conservation Service, Spartanburg, S. C.

forming the highland, it is covered by a relatively thin layer of soil.

For 100 years or more, sugarcane was the principal crop on the island. During this era, enough soil washed from the highland to build a road around the island 12 feet wide and 4 feet higher than the adjacent cultivated fields; but the greater part of the soil that was lost washed into the swamp and marsh.

Ned Simmons, vice president of the company, developed a conservation plan for the island, with the help of Dolan Kleinpeter, Soil Conservation Service soil conservationist assisting the Iberia-Vermilion Soil Conservation District. Simmons' first concern was to keep the runoff from the central highlands off the pepper fields. This was done by putting in a diversion ditch above the fields. At intervals along the diversion, drop-inlet structures of concrete and steel lower the water under the road and into grassed waterways, where it is safely conducted to the swamp.

The next problem was to keep the water that falls directly on the pepper fields from damaging the land. This was done by a combination of land leveling, parallel terracing, proper row arrangement, sodded V-drains, crop rotation, cover crops, and the use of crop residues. Conservation has

been extended to all parts of the farm—the central highlands, the pepper fields, and the swamp and marsh.

In the marsh, measures have been installed where feasible, to regulate the quality and quantity of water, thereby improving the habitat for waterfowl and other wildlife. Simmons also is encouraging the propagation and growth of desirable food plants and feeding conditions for marsh wildlife.

The entire island is managed for wildlife and teems with deer, wild turkey, quail, and many species of small game. The pepper fields are fenced to keep the deer out, but Simmons has provided 100-foot-wide, grassed "deer gaps" between the fields to facilitate the passage of the deer from the swamp and marsh areas to the interior of the island.

"It was because of this conservation heritage, and a deep personal conviction on my part of the importance of conservation, that we got a practical conservation plan for the island," Simmons says. "But we'd been practicing soil conservation long before that. I have a land use map that was used by M'sieu Ned at the beginning of the century, that shows how the land was being used. Even then all cultivation was on the contour, when no one else in this part



Pepper ready for harvest is checked by Dolan Kleinpeter (r.) and Tom McGourin of SCS.



Concrete structure that drops water from diversion ditch into grassed waterway.



One of the Avery Island farm ponds that are used to irrigate peppers during droughts.

of the State had ever heard of the practice. M'sieu Ned's map not only shows it; the evidence can still be seen on the land."

"While we have a family feeling for the island, and want to keep its resources intact," McIlhenny adds, "I'm frank to say that looking at it from another angle soil conservation is also a cold dollars and cents proposition with us. I'd be less than honest if I didn't admit that. We've got to practice conservation if we stay in the tabasco business, whether we want to or not."

Iowa County Pushes Roadside Erosion Control

By John G. Wilson



Untreated side of road showing continuing erosion on back slope and in ditch.

ROADSIDE erosion control and beautification is taking hold in Iowa's Jasper County Soil and Water Conservation District. The district has demonstrated the fact that crownvetch will stabilize steep roadside back slopes and check erosion while adding beauty for the highway motorist. This means that many tax dollars now spent for maintenance on county highway systems well may be saved by a coordinated erosion control program carried out in cooperation with adjacent landowners.

In the spring of 1960, a new road adjacent to the late Fred Maytag II property was graded by the city of Newton. An unusually steep back slope was developed, making it impossible to operate with power equipment in preparing a seedbed. Also, such a slope could not be maintained by mowing with ordinary equipment.

Maytag farms were early cooperators with the Jasper district in developing extensive soil and water conservation plans, and Maytag

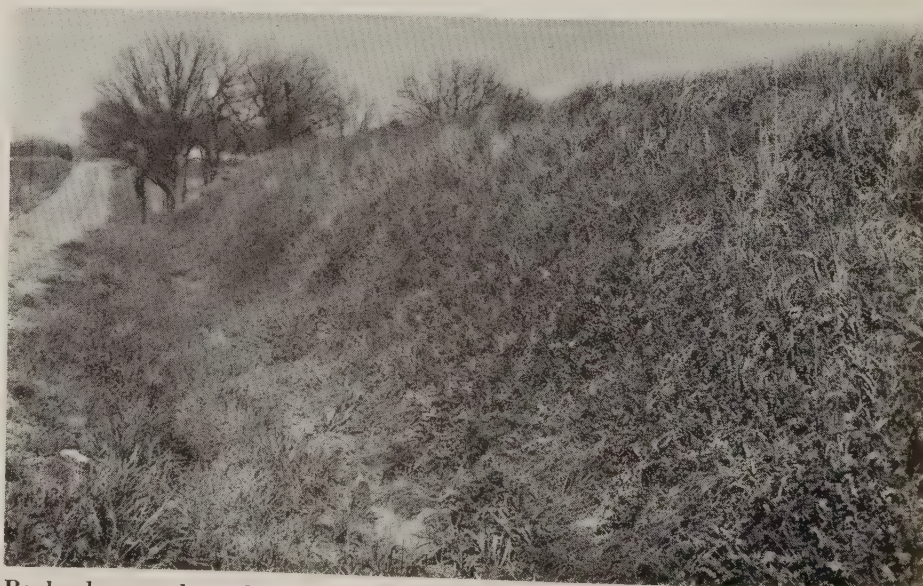
turned to the district for help on this newly created problem. Soil Conservation Service technicians working with the district agreed to furnish part of the labor, with the landowner supplying the materials and the rest of the labor needed to demonstrate roadside erosion control and beautification.

The soil on the back slope was

hand raked to prepare a seedbed and create a roughened surface so seed would remain in place. An application of 0-20-0 fertilizer was made at the rate of 400 pounds to the acre, followed by seeding of 15 pounds of crownvetch and 10 pounds of alta fescue an acre. To keep surface rilling from occurring in case of water runoff and to provide insurance for holding moisture, a straw mulch at the rate of 3 tons an acre was used, held in place by use of mulchnet stapled to the slope.

To make the demonstration complete, the adjacent roadside ditch and fore slope were fertilized and seeded with a mixture of 10 pounds of brome grass and 10 pounds of alta fescue to the acre, with oats as a cover crop. Also, on the steeper grade of the ditch, Reed canarygrass was transplanted and an erosionnet used to assure stabilization against erosion until sod established itself.

By 1962, the entire area was well established with vegetative cover. The steep back slope had



Back slope and road ditch completely stabilized with crownvetch and companion grasses.

The author is work unit conservationist, Soil Conservation Service, Newton, Iowa.

noticeably dense cover from the spread of the rhizinous root system and new shoots of the crownvetch. Complementing this dense cover, thousands of purplish blue flowers provide beauty to what could otherwise have been a barren and ugly eroded area. The opposite side of the road, which was not treated,

makes this fact vividly stand out to passing motorists.

The demonstration has been used by the Jasper district as an example to encourage the County Board of Supervisors to carry out an expanded erosion control and beautification program. An average of about 10 miles of road is

regraded each year in the county. Seed is furnished the farmers adjacent to these new grades; and the farmers in turn provide the labor for seeding and maintenance, by mowing after establishment, on all but the problem areas. These areas will be given special attention by the supervisors.

Dugouts Save Water

For Nebraska Farms

By James McDowell

NEBRASKA farmers are digging, not for gold or oil, but for something to them as precious—water.

The “holes” that result are called sumps, pits, or dugouts. Each is part of a tailwater recovery system which allows the farmer to reuse irrigation runoff previously wasted.

In 1961, the Agricultural Conservation and Stabilization Service approved the practice for cost-sharing in eight south-central Nebraska counties. Since then, 55 or more dugouts have been dug in the Fillmore County Soil and Water Conservation District alone.

The pits are dug where they can intercept waste water from irrigated fields. This is usually just off the side of a low spot where the drainage leaves the field or farm. Where possible, the dugout is located so that floodwater will bypass the hole and only comparatively silt-free water can enter.

Cost-sharing covers about half the cost of construction, particularly if the dirt doesn't have to be transported too far away from the hole. Soil Conservation Service technicians help the farmer spot the best location for the dugout. They usually find uses for the extra earth, such as leveling a field,

building up a pipe lateral, filling a washout, or building a road to the well.

The pits are designed to store enough water to allow for at least a full day's irrigation with a boost-

enough to suit the purpose. Biologists see in each of these ponds a potential nesting area for a pair of ducks.

The ponds supply livestock water when fields are being pas-



Thirsty corn gets its first drink from irrigation pit on F. J. Kimbrough farm near Geneva, Nebr.

er pump. In most cases, the water pumped from the dugouts is better than when it comes from the well. It is quite a bit warmer, and it often has some dissolved fertilizer picked up along the way.

There are other potential benefits from these ponds. Many are large enough to be used as private fishing and duck-hunting ponds. Most are being built on farms with terrain too flat for the conventional dam, but these quarter-acre ponds usually are wide enough and deep

tured. They also may be a source of rural fire protection, and have additional value for ground-water recharge.

An important byproduct is the new peace and harmony the dugouts are bringing into neighborhoods where individuals have called attorneys to ask: “What can I do about my neighbor's irrigation water running across my farm?” Nebraska farmers are discovering that irrigation pits offer a practical profitable solution.

The author is work unit conservationist, Soil Conservation Service, Geneva, Nebr.

Soil Surveys Basis For Land Assessments

By Leonard A. Anker

A VOLUMINOUS publication titled "Soil Survey of Carson Valley Area, Nevada," is in preparation for publication and distribution in Douglas County. Although not intended as a best seller, parts of it already have been useful to officials and residents of the Carson Valley Soil Conservation District:

It has aided farmers in planning best use of their soils. It has been used in assessing agricultural lands, and is now considered as one of the bases for water distribution by the Carson Water Subconservation District.

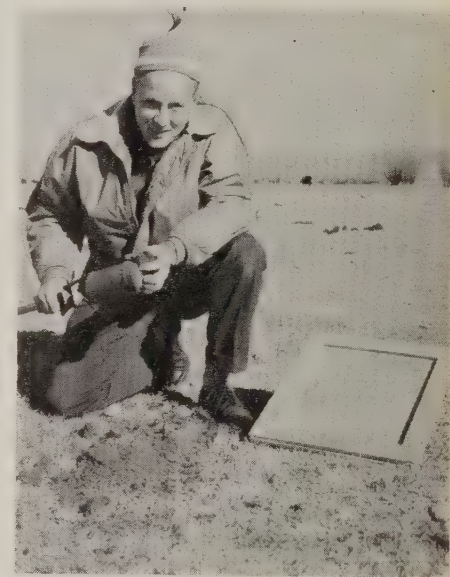
These are just a few of the uses made already of the soil survey information mapped by the Soil Conservation Service. An agreement to finance a soil survey in the Carson Valley area of western Nevada was signed in the late summer of

1958 by Marvin Settelmeyer, chairman of the Douglas County Commissioners, Roy Godecke, then chairman of the Carson Valley district, and C. W. Cleary, Jr., State Conservationist of SCS.

Cold weather and other difficulties delayed completion of the fieldwork until 1959, and some delay occurred when it was decided to add lands across the California-Nevada State line. But in 1960 the Douglas County assessor in collaboration with the Nevada State Tax Commission was able to use the maps to set up a system of valuations for tax assessments. Water supply and other factors were considered. The result was appraisals based on the productive capacity of the lands, rather than those based on sometimes inflated sales prices.

Ranchers are interested in the soil surveys because they realize their taxes are based upon them. The tax assessment program was the leading reason Douglas County helped pay the cost of the survey. Several other counties in Nevada now are interested in the possibility of adopting the procedure in their tax assessment programs. The first year of the new arrangement, the Douglas County Grand Jury upheld the agricultural land tax assessment by soil conditions and water rights, saying that "This plan appears to be the most fair and equitable plan yet devised for agricultural lands."

Cooperators in the Carson Valley district are planning the development of their ranches based on the soils information derived from the

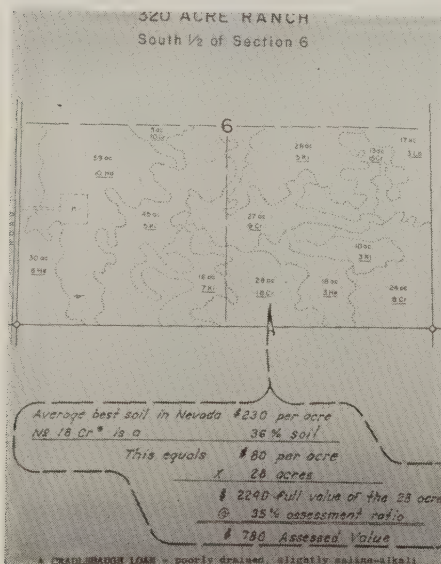


SCS Soil Scientist Lou Langan with auger and aerial photo on which he records information

survey. Detailed information about the soils of each place enables the owner or its operator to make intelligent management decisions. These result in the most efficient use of the soil and water resources of each ranch.

In arid Nevada, water supplies probably limit crop production more than do the soils. Under a large reclamation project, the local water agency—the Carson water district—has encountered the problem of how best it might distribute the irrigation water developed. Again, the survey has been brought into use. Porous soils, those with high infiltration rates, are being singled out to receive extra amounts, because of their inherent poor irrigation efficiencies.

Ranchers wanting to know what their soils look like can see mounted soil samples and soil maps at the Gardnerville SCS work unit office.



Assessment map shows area of each soil and its code name.

The author is work unit conservationist Soil Conservation Service, Gardnerville, Nev.

Conservation Land Patterns Draw Migratory Waterfowl

By Charles Slaton

DUCKS and geese are in for a real treat and so are the hunters in Pennsylvania. Three thousand acres of farmland have been added to the huge Pymatuning marshes in Crawford County by the Pennsylvania Game Commission. All of it is being planned to improve "the view" for migratory waterfowl.

Shortly after the first farms were acquired, the Commission enrolled them in the Crawford County Soil Conservation District program. A conservation plan for 1,500 acres in the project was developed with the help of the Soil Conservation Service. The remaining land is scheduled for planning this year.

Project "Controlled Goose Hunting for Pennsylvanians" started several years ago with the Commission's purchase of several farms

adjoining the Pymatuning wildlife refuge. Today, the aerial view of 2 dozen farms is being changed to entice the honkers of the North to pay us a visit. The gimmick is food: corn, clover, wheat, and grass. The long-range use of the newly acquired farmland is for the controlled shooting of geese.

"But our first need," says Ray Sickles, waterfowl management agent for the Game Commission, "will be to attract and hold the geese in the area. We are even hopeful that some increase in nesting will be accomplished.

"Right now, we have enough resting areas for migratory geese, but we came up short with food. With an increased supply of goose pasture and grain, the geese may stick around to thrill many a nimiral. We have started to develop the farmlands as the first step in our controlled goose shooting program."



Result—improved hunting in surrounding farm country, and ready cash for enterprising landowners.

The area, as Sickles sees it, also will help improve goose hunting in the surrounding farm country. It will serve as a nucleus to which geese will be attracted from the Atlantic flyway. Many of these geese will explore the nearby country and will provide some fancy shooting and ready cash to the enterprising landowners.

"In developing the plan," SCS Work Unit Conservationist Howard Gates explained, "the better drained soils were set aside for the production of corn and small grain. The grain will be harvested and fed to the webfeet during the winter and early spring months. The wetter soils will be used for goose pasture. Ladino clover and tall fescue are well adapted, and the geese seem to relish the mixture."

The average Canadian goose weighs 6 to 10 pounds, and it takes a lot of feed to support the wily bird. Thousands of geese use the



Conservation pasture and grass crops draw geese to Pymatuning wildlife refuge.

The author is assistant to the State conservationist, Soil Conservation Service, Harrisburg, Pa.

Pymatuning area each year, staying from 1 day to 2 months. To meet the grazing needs of their chomping bills, a program of heavy fertilization to keep the pastures green has been scheduled.

"In planning the farmlands, the goose and his needs are never forgotten," Gates emphasized. "To provide the wide-open-space look, more than 22 miles of hedge rows have been removed. Corn is plant-

ed in wide rows with legumes planted between the rows. Not only does this open up the area, but it extends the length of feeding time."

Shallow ponds have mushroomed in many of the sags and seepy areas. Some of the pond water supply will come from the managed agricultural land, and the water in the ponds will be regulated to produce aquatic food and

serve as nesting sites for the waterfowl.

The controlled goose shooting area is now a welcome landmark on the Atlantic flyway. Thousands of geese find its well-tended look, marked by stripcropped fields, new pastures, ponds, open drains, and waterways, a pleasant resting and feeding area. And it is resulting in improved goose hunting in Pennsylvania!

\$30 An Acre Fishing Profits From Once Useless Wetland

By Carl H. Thomas and John Cross

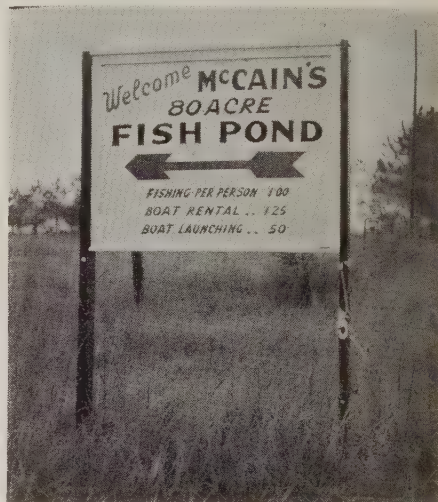
TOO wet for farming—too dry for fish.

That's the way Curtis McCain and George Greathouse, cooperators with the Gulf Coast Soil Conservation District, described 80 acres of marshland they own in Cameron Parish, La.

Soil scientists with the Soil Conservation Service classified the land as Class VIII—too soft for rice cultivation, or even for marsh range, without drainage. That would have been a king-size undertaking; so, instead of removing

the water from the area, the owners added water and converted it into a farm pond. As a result, the area now provides recreation for both farm and city people, as well as extra income from formerly idle land for McCain and Greathouse.

The pond was made by building a levee around the area, just high enough to keep enough water on the land for fish. A pump was installed to put fresh water on the 80 acres, and a spillway was constructed to allow excess water to



Roadside sign brings in fishermen—at \$1 a head.

move off in case of heavy rainstorms. The pond was stocked with 80,000 bluegills in October 1960. The next spring, 8,000 bass were added.

One year later, in May 1962, the pond was opened for fishing. By the end of August, 2,200 people had paid a dollar a day for fishing privileges. Many of them had rented boats for a small fee. A bait stand and refreshment stop, also operated by the owners. Add to the convenience of the fishermen and the income of the owners.

The whole operation is a paying proposition on land that before had not produced enough to pay its share of the taxes. Developed according to its capabilities for recreational use, it grossed almost \$30 an acre the first year!



Weed beds made to order by vegetation that came up before pond was finished.

Note:—The authors are biologist, Crowley, and assistant State soil conservationist, Alexandria, both of the Soil Conservation Service, Louisiana.

WATER ON WHEELS

By John K. Hortin

KEN Uchida found that using wheel-move irrigation sprinklers is the best way to get along with the dry summer climate in the Hot Springs area of Utah.

For years, he considered using sprinklers—and even operated a small portable outfit for a time—but it wasn't until 1961, when Soil Conservation Service snow survey reports warned that a drought was on the way, that he decided to go all out with sprinklers. Here are some of the reasons why they are paying off on the approximately 350 acres of irrigated land on his 450-acre farm in the Weber Soil Conservation District with which he is a cooperator:

He is the last of 350 stockholders in the North Ogden Irrigation Company, where streamflow fluctuates from little water to 12 cubic feet per second.

Water losses from sandy soils and open ditches were high, and the sprinklers have proved to be

better adapted to short water supply. Also, because of higher irrigation efficiency, less water now is needed.

Savings in manpower for irrigation have been as high as 90 percent.

Nearly all of Uchida's irrigation water is pumped from a reservoir, and little additional operating cost is required.

Larger fields resulting from leveling much of the land are more efficiently operated with modern equipment.

Uchida planned to sprinkle 100 more acres and to tie a beef cattle operation into his farming, to help market his alfalfa hay and increase production.

He says such disadvantages as a temporary disruption of his crop rotation system were soon forgotten in light of his savings in water and manpower.

Three men used to irrigate full time. Now, one man gets off the



Pump for the sprinkler system.

tractor and changes a quarter-mile line in 10 minutes.

Uchida's potato farming now is completely mechanical, and his sugar beets also are becoming a mechanized crop. Other crops such as tomatoes and onions, that require a lot of hand labor, play a less important role on the Uchida farm as machines replace the man and his hoe.

Going on the premise that "You can't starve profit out of the soil," Uchida follows scientific recommendations in the application of fertilizer. He uses soil tests and correlates fertility with the needs of the crop to maintain high production.

"Before I make definite plans each year, I look to a number of sources for prospects," he says, "but our biggest concern is the amount of irrigation water available. I cannot afford to take chances with my water supply. I keep in touch with the SCS to get firsthand information on snow conditions."

Besides operating his farm, Uchida finds time to serve as secretary-treasurer of the Weber County Beet Growers Association and as a major in the 501-6th Army, Garrison Army Reserve stationed at Fort Douglas, Utah, and to be an active worker in the Ogden Japanese Christian Church.



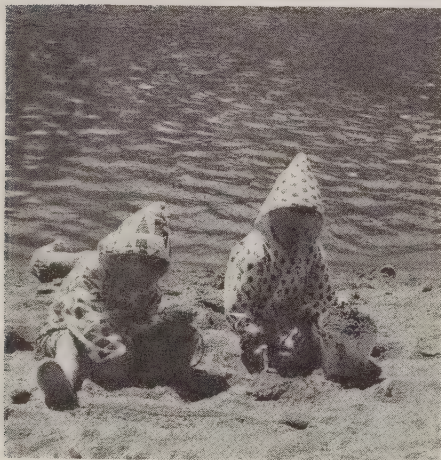
Uchida's wheel-move sprinkler in operation.

The author is soil conservationist, Soil Conservation Service, Ogden, Utah.

Conservation Contractor Converts

Idle Land To Recreation Center

By Christopher G. Moustakis



"Air View" is ideal playground for busy bucketeers like these.

MASSACHUSETTS Contractor Joe DeDeo fulfilled a personal ambition and met a community recreational need by building an outstanding water recreation center on a tract of idle land on the edge of his home city of Marlboro.

The area, known as the "Air View" recreation center, has a large manmade pond for swimming, a picnic area with fireplaces, and floodlights for skating. DeDeo put to work all the know-how and experience he gained in building and grading many a wildlife, irrigation, and livestock pond for Middlesex Soil Conservation District cooperators, to shape up to a 20-acre recreation-wildlife area. He got some help from the district and the Soil Conservation Service in laying his plans.

The center of attraction, carved out of 8 to 12 feet of flat muck-land underlain with gravel, is a 5-acre, springfed dugout pond. As

DeDeo said, "there's enough water pressure there to keep that water changing, and tests show that it's good enough to drink."

"My ambition has been to buy a piece of idle land like this and make a recreation area out of it," he explained. "It will be a place of retirement for me some day; and at the same time I can provide some fun for people—you know how tight water recreation areas are getting around here!"

"The city officials welcomed me when I asked for permits to go ahead. They thought the recreation project was a fine idea and good for the city of Marlboro."

DeDeo bought the land in 1959. He got soils information and engineering advice from the Middlesex district. He cleared the pond area right away and, in between doing conservation work for the district, used his dragline and bulldozer to dig his own pond. Two years and 35,000 cubic yards later,

the pond was finished. Much stump burial, dirt removal, grading, sloping, and sanding readied the place for business.

The finished job offers a 1,200-foot beach around the edge of a peninsula and half a mile around the outside edge of the pond to swimmers in the summer, and 5 acres of ice surface to skaters in the winter. There's a trout fishing area too. Around the pond, picnickers can relax under pine-oak and use fireplaces to roast their hot dogs. DeDeo opened the area to skaters in January and to swimmers in June of 1961.

"The best days bring 850 people here," he reported. "Maybe 10,000 used my place last summer, but of course many come back again and again. I get repeat visitors from 40 to 50 miles away."

He intends to expand on the variety of recreation available by building a tennis court and a ball field for the summer visitors, and



An air view of "Air View."

The author is State Soil Conservationist, Soil Conservation Service, Amherst, Mass.

an outdoor hockey facility for the winter. He also will make use of the wildlife resources.

"I found that people get a great deal of satisfaction out of just watching the rabbits and the pheasant in the area," DeDeo said. "Pretty often, I'm lucky enough to get ducks and Canadian geese stopping over at the pond. I intend to plant parts of the area to trees and shrubs that will attract and keep wildlife here."

"The project took the better part of a year's use of equipment at a considerable cost, particularly with building facilities," DeDeo said, "but I had some byproducts, too. I had a good 15,000 cubic yards of muck, surplus to my need, and about 10,000 cubic yards of fill. I also had some red maple wood which I split and used in the skaters' clubhouse fireplace and for the picnic area fireplaces. I used all of this byproduct to offset some of the cost. I sold some muck and fill and bought fine sand for the beaches."

DeDeo feels that converting idle



And on the beach.

land to a multipurpose facility for recreation is good conservation, especially where the urban spread is being felt strongly in rural areas. He believes that there are any number of landowners who could cap-

italize on the recreational potential of nonagricultural parts of their holdings to supplement the farm income and meet outdoor recreational needs apparent in any rapidly developing urban area.

Conservation Nature Centers— Laboratories for Land Learning

By Herbert I. Jones

THIS summer millions of Americans who care little about hunting and fishing or whose limited time precludes extended trips are discovering conservation and enjoying the out-of-doors through visits to community nature centers.

These areas of undeveloped land near cities and towns have facilities and services designed to conduct programs in natural science, nature study and appreciation, and in resource conservation.

The conservation nature center is a fairly new concept in com-

munity education and recreation and differs from such older, well-known city facilities as a park, zoo, museum, playground, or picnic-camping site. It is, ideally, a sample of the natural landscape of the community—of forest, tideland, or prairie—a part of native America set aside and interpreted for the enjoyment and edification of people.

A nature center is designed to orient the community to ecological realities and in this way help citizens plan their use of land scientifically and responsibly. There are perhaps a hundred such centers across the Nation. All represent

naturalness rather than manmade facilities. Among the older, more prominent centers are Aullwood Center near Dayton, Ohio; the Children's Museum at Charlotte, N.C.; Bear Mountain, N.Y.; Big Cypress in Florida; and the Arizona-Sonora Desert Museum at Tucson.

Last year 70,000 people visited the growing interpretive center and yet incomplete exhibits at Ghost Ranch northwest of Santa Fe, N. Mex. School groups, Scout troops, church classes, farm and ranch families, and scientific societies were among those counted. School officials transported whole

The author is field information specialist, Soil Conservation Service, Denver, Colo.



Telescope views at Ghost Ranch fascinate young and old. Here the scene is a geologic wall.

classes of Albuquerque youngsters more than 125 miles to the center to help them develop concepts of conservation and to learn lessons only contact with the land can teach.

This summer, groups of young churchmen visiting nearby Presbyterian Conference headquarters are lending a helping hand at Ghost Ranch with weeding, seeding, and trail work. Monoliths and other soils exhibits are being placed by

Soil Conservation Service and New Mexico State University scientists. These exhibits follow field erosion-conservation demonstrations; and eventually the SCS's total program will be represented in display.

Before long, a 6' x 12' scale model and mounted telescopes will illustrate principles of and direct visitors to the Santa Cruz watershed protection and flood prevention project. The U. S. Forest Service has installed a 2-acre mini-

ature forest exhibit. Animals of the area are displayed to attract attention. Development of this center is under the direction of the naturalists, William H. Carr, and the Charles Lathrop Pack Foundation.

The Plains Conservation Center near Denver, Colo., is an even newer center. It is the first one in the Nation to be sponsored by a soil conservation district.

Supervisors of the suburban West Arapahoe Soil Conservation District bought 2,000 acres of rolling prairie 14 years ago and set up conservation demonstrations. Later on, university biology students did research, and youngsters planted trees, studied soils and grasses, and hiked the pioneer trails. Eventually, as the city expanded, the district leaders recognized theirs was a greater opportunity for resource-nature training. By this time, the metropolitan area had nearly 200,000 school age children. Many had had little opportunity to learn about the Plains, although they are at the city's doorstep.

The result has been the organization of the Plains Center Association. Its board of trustees includes many nationally recognized business, educational, and civic leaders, as well as professional conservationists. The West Arapahoe district board now employs an educational supervisor. Before the year ends, plans for building an interpretive center and permanent exhibit will be completed.

The growing national interest in outdoor recreation-education was reflected in the creation of a Nature Centers Division of the National Audubon Society 2 years ago. Nature Conservancy and many other groups also are prominent in this field. Last spring more than 100 people from across the Nation gathered at Asilomar, Calif., for what may have been the first workshop ever held on the creation of centers. Out-of-door teaching is high on the agenda of the Soil Conservation Society of America's na-



Exhibits of range sites and condition are featured at New Mexico center.

tional meeting to be held in Logan, Utah, August 25-28.

Thus the need and usefulness of nature centers in more heavily

populated sections where national and State outdoor areas have become overtaxed is receiving more attention at the community level.

where soil conservation districts and other conservation interests can play a leading part in creating such centers.



Some of the members in front of clubhouse built to serve also as fallout shelter if needed.

WHAT to do with a seemingly useless 14-acre hole in the ground was Victor Esham's problem after the last truck load of highway earthfill left the borrow pit on his farm 2½ miles from Berlin, Maryland.

Berlin was dumping in an abandoned borrow pit closer to town and did not need an additional pit. Regrading and trying to farm the land was not the answer, because the soil is droughty and never did produce well. Letting the pit revert to timber likewise would not have worked, because the exposed sterile soil would support only poor tree growth.

Esham's answer came in 1953 with the formation of the Queponco Bowmen's Club, which chose this archery range site because of the rough terrain and the short distance from town. Today, after a decade of increasing use by vacationing archers from as far away as Washington, D. C., Philadelphia, Pa., and Baltimore, Soil Conservation Service technicians cite it as an example of good land use suited to the particular conditions.

The author is soil scientist, Soil Conservation Service, Snow Hill, Md.

BORROW PIT MAKES

GOOD ARCHERY RANGE

By R. L. Hall

The abandoned borrow pit, from 5 to 10 feet deep, is a rugged piece of ground, piled high with mounds of earth and stumps. Uncommon to the area, the pit did not fill with water. Difficulty in finding lost arrows, because of this terrain, gave the site the name, "Lost Arrow Range." Room to set up 28 targets required 6 more acres, on a steep bank between the pit and a stream.

The Lost Arrow Range has roads, trails, and a clubhouse built into a bank and covered with sand bags. Members did all the construction, with a cash investment of around \$1,000 for materials. Yearly dues of \$10 help pay maintenance

costs.

The Club holds a 2-day meet once a year, which draws archers from 150 to 200 miles away. The range is both interesting and challenging, in that it presents a variety of situations. Top score on the Lost Arrow Range to date is 421 out of a possible 560. The range is about 5 miles from Maryland's seacoast resort of Ocean City.

Esham's only payment for the use of his land by the Club is a free membership—and the satisfaction he receives from knowing he is furnishing opportunities for recreation being sought by growing numbers of people.



Queponco Bowmen Club archers take aim at one of 28 targets from foot of a spoil bank.

Conservation—A Profitable Way of Life

By William Ross

TO Idaho farmer Carl Christensen conservation is a profitable way of life.

Conservation did not just come to Christensen—he and Mrs. Christensen and their children have had to work for it. When he bought the farm in the Sterling area in 1953, he asked a friend where he might get some help with his ideas on conservation. This friend told him that the best way to get the kind of technical help he needed would be to help form a soil conservation district. This he did.

Christensen circulated petitions and worked hard in the organization of the South Bingham Soil Conservation District, which was organized in 1955, was one of its first cooperators, and now is an alternate supervisor. He called on the district board for technical help

from Soil Conservation Service technicians in working out his own problems, and before long had developed a complete plan of soil and water conservation. Now, 7 years later, all of his fields have been leveled, and the complete plan applied.

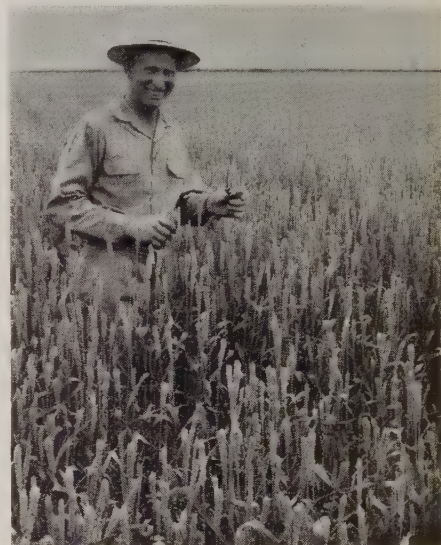
In expressing his views on conservation, Christensen said: "To me, conservation is a way of life. Conservation means to produce more from the soil with less work, water, commercial fertilizer, and money, and to save the soil for future generations—or to have the land in better condition for the future than when I acquired it."

The way conservation can increase the loan value of a farm is an important item, Christensen believes. He said that between 1953 and 1958, one agency increased the loan value of his farm by more

than \$7,000.

His sugar-beet yields have increased about 6 tons an acre, and his hay yields have increased about 2 tons to the acre.

Since leveling his land according



Christensen estimated this field of wheat would yield 90 bushels an acre.



Christensen (r.) and Bill Ross of SCS discuss importance of improved pasture in overall conservation program.

to the plan, he says he can irrigate in his Sunday shoes, and with a substantial saving in labor.

"I don't have to walk down those rows to see where the water is," he explained. "I know when it is going to get to the other end. One of my fields used to take about 2 weeks to irrigate. Now, I can irrigate it in 4 to 5 days, depending on the amount of water I have.

"When I came on the place, the Agricultural Conservation Program had the fields numbered for identification. I had 26 different fields, and now I have 9. If I hadn't leveled my land, I would never have been able to make the place pay. You bet leveling pays!"

Christensen also considers drainage to be one of the most important

Note.—The author is work unit conservationist, Soil Conservation Service, Aberdeen, Idaho.



Harvesting sugar beets on land leveled the fall before.

parts of his plan. He is now able to drain every field, with no water left on the land to drown out crops.

Along with being a good conservationist, Christensen is a good family man. His wife feels the same way he does about conservation. She has gladly done without many things in order that the money be spent to improve the farm. One or more of his children usually works with him. He has six girls and two boys. His oldest son helps with the tractor work,

but the girls do their share, too!

This Idaho farmer doubts that conservation farming is possible without livestock. He usually keeps about 15 head of beef stock, 20 milk cows, and 100 sheep. His oldest son and daughter share the milking chore.

In 9 years, the farm has more than doubled in value. Meanwhile, Christensen has bought another 160 acres and promptly set about arranging for a conservation plan which he is applying on it, also.

Irrigation Improvement

By J. E. Preston

DICK HUMBERT turned 50 acres of poor land of uncertain yield near Walden in north-central Colorado into a high-producing hayland with a relatively low investment by solving an unusually tough erosion problem and making more efficient use of irrigation water.

A too rapid flow of water had cut a miniature Grand Canyon into Humbert's land. He had tried many ways to slow up the speed of the water in the last 2,500 feet of the big Wolfer ditch, but nothing seemed to do the job. The result was caved-in ditch sides, with clogged supply and spreader ditches beyond. The silt spread over areas of Humbert's meadow, and trying to keep hay production up under such conditions was out of the question.

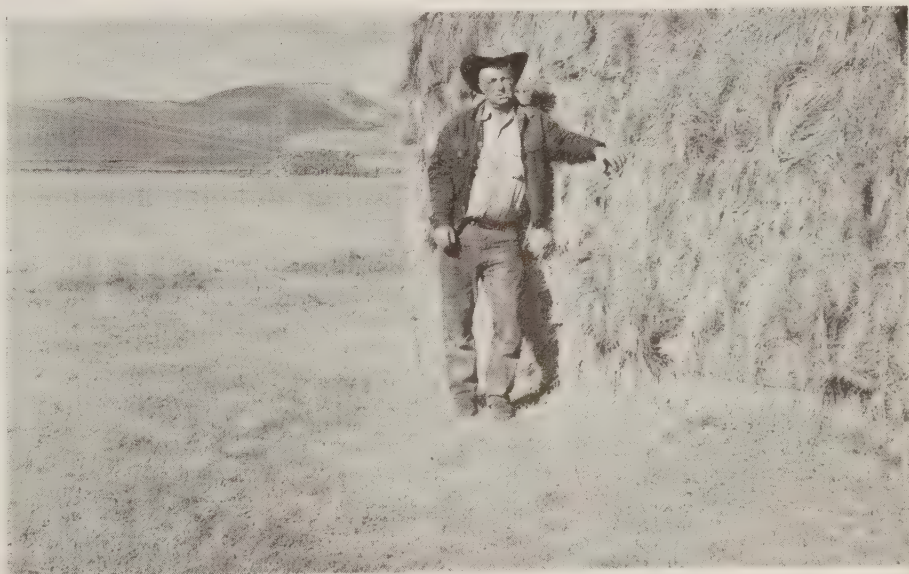
"It was a real mess," Humbert recalls. "Every year I would spend days working on that ditch with my tractor. Finally I realized the problem couldn't be solved. It had to be erased."

Humbert already was making good progress with his complete

soil and water conservation plan through the North Park Soil Conservation District, and in the spring of 1960 determined to deal next with his chief erosion problem. Soil Conservation Service technicians designed a concrete inlet structure and spillway for a 30-inch pipe to take the water safely to the lower section of the ditch where it could flow into Humbert's contour ditch irrigation system without damage. Construction began in the fall of 1960.

Use in the following spring proved the new structure to be successful. Humbert's alfalfa-brome meadow may have been the only hayland in the district yielding two cuttings that year. They averaged nearly 2 tons to the acre. In the 1962 season the cuttings were nearly as good. In North Park, the production average is about 1 ton an acre a year on native hayland.

Ahead of Humbert in carrying out his soil conservation plan is



Humbert with hay grown under improved irrigation system.

The author is soil conservationist, Soil Conservation Service, Walden, Colo.



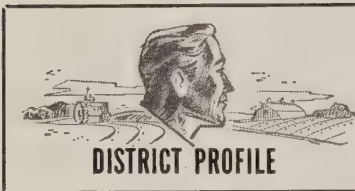
The big gully that caused Humbert so much trouble.

the leveling of 50 acres for more effective use of water, and survey-

ing of irrigation ditches and structure sites. He knows this improvement will be profitable, because on a 2-acre tract he leveled and seeded to a grass-and-clover mixture he got 5 tons of hay in one cutting. Humbert also is keeping an eye on a 6-acre trial planting of meadow foxtail and Alsike clover, which is a part of the acreage he is able to use efficiently now with the new pipeline and stilling basin.

Humbert, with his improved water delivery system, will irrigate 800 acres now.

"Before, I was irrigating 650 acres and doing a poor job of it," he said. "I will not only be able to use my land better, but I can make the water I have go a lot further. In this country, that's important to an irrigation rancher."



From Boxing To Ranching—

A Winner in Both

As a young man Walt Fick was a boxer. He won in the Midwest Golden Gloves tourney in Omaha and boxed in Chicago. In the national matches in Boston, he was eliminated by the international champion.

Professional bouts provided Fick with money to buy his first heifer calf. Later he bought more calves, and finally, in 1939, he bought his first grazing land.

Thanks to the help of his wife and five children, rancher Fick today owns and operates a 2,760-acre ranch in Holt County, Nebr. The ranch is pastureland with wet-meadows for hay. It is an excellent example of conservation ranching in that area.

Fick, who operates a 115-cow herd of commercial grade Herefords, follows a conservation district plan worked out with Soil Conservation Service technical help. The plan includes a variety

of measures for protecting his land and maintaining efficient production. These include deferred grazing and other proper range-use practices, range and meadow seeding, a well for stockwater, farmstead and livestock tree windbreak plantings, and management of 31 acres of lake, marsh, and sand areas to provide wildlife food and cover.

It takes time to become a successful rancher; but, because Walt Fick believes in actively serving his community, he finds time for other things. These have included service as chairman of the Holt County Soil and Water Conservation District board of supervisors, member of the local school board, president of the Nebraska Section of the Range Society of America, chairman of the committee on range judging from the State Association of Soil and Water Conservation Districts, chairman of

the Holt County school re-districting committee, and member of the Holt County Extension Board.

He says he is glad that his operations are on a family-size unit so that he can give time to local organizations that he recognizes are a part of a true democratic society.

In 1961, Fick, as a 4-H Club leader, trained his club members and took them to Oklahoma City. There, the club placed first in the International Range Judging Contest. Fick entered the adult contest and won high individual honors. Later that year, he took first place in the professional division of the Nebraska range judging meet.

He believes ranching is the best expression of individualism today, and that here a man can reach as far as he cares to extend himself. He also believes that the home is the place to teach young people

proper values, and that the American way of life will be carried on in direct relation to this teaching.

Looking back on his early experience in boxing, Walt Fick admits that such skill may have no place these days in ranching. Still, he says, the competitive spirit that is



Walt Fick.

so valued in the ring stands a man in good stead when he is defending principles important in life. And, of course, those first earnings in his ring career got him started in the life he loves. There is satisfaction in that.

—C. DALE JAEDICKE



DISEASES OF TURFGRASSES.
By Houston B. Couch. 289 pp. Illus. 1962. Reinhold Publishing Corp., New York. \$10.00.

This book presents detailed information relative to the identification, nature, and control of many diseases affecting turfgrasses, including illustrations essential for identification. In all, 48 diseases caused by physiogenic factors, viruses, bacteria, and parasitic or

predatory animals are discussed. Included for each is information on symptoms, host plants, and the disease cycle.

Description of the symptoms includes those that occur when the grass is used in lawns and, in some cases, when the plant is in the seed stage. In addition, there is a comprehensive list of forage grass species, by common names, that are susceptible to turfgrass diseases, and also a list by technical names. More than 400 species are listed in the tables and convenient references to the susceptible diseases.

The author has included nearly 200 references of technical publications on the subject, which should be helpful for the turfgrass specialist and soil and water conservationists increasingly concerned with recreational area land-use developments.

This book should be a good reference for pathologists, agronomists, and turfgrass management specialists dealing with golf courses, park maintenance, and defense agency lands. It also has some value for those interested in conservation in general, as many species of grasses used for erosion control are host plants for various turf diseases.

—B. D. BLAKELY

THE STORY OF DAMS. By Peter Farb. 127 pp. 1961. Harvey House, Inc., Irvington-on-Hudson. New York. \$2.95.

This is a well-written book with excellent illustrations, diagrams, and line drawings, as well as four pages of full-color sketches showing eight world-famous big dams. "The Story of Dams" has a place on the science shelf in the upper grades or junior high library of any school. Several appropriate experiments and field projects have been incorporated that teachers can use in their soil and water conservation units, or that can be carried out by the young scientist without supervision.

Chapter 1 covers the water

cycle, importance of water in modern society, and future water requirements of industry and agriculture. In chapter 2, the author pays tribute to modern soil conservation and the Soil Conservation Service. He describes the beneficial effects of conservation practices in reducing sediment production, thus prolonging the useful life of downstream dams and reducing the amount of flood-producing runoff water.

Succeeding chapters picture outstanding examples of each type of big dam and describe it in considerable detail. The reader thus learns of gravity, arch, and buttress types of concrete dams and compacted earthfill dams, how to recognize these structures, conditions under which each is used, and problems in designing and building them.

The author describes each of the many needs which large dams fulfill. They control floodwaters, provide hydroelectric power, store water for irrigation and city water supplies, and provide man-made lakes for recreation. He also discusses systems for control of entire river basins, including the Columbia River Basin and the Tennessee Valley.

Although the author has capably described effects of individual farm conservation programs on water quality, quantity, and sediment production and the place "big" dams play in water management of large river systems, it must be pointed out that he failed to mention the function of small dams in "small-watershed" programs on community-size, upstream watersheds or the watershed program of the Department of Agriculture.

—ALLEN L. FISK

IRRIGATION AND CLIMATE.
By Henry Olivier. 1961. Edward Arnold Limited. London. \$25.00.

Olivier proposes a procedure for estimating irrigation water re-

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quirements of crops, and recommends it as a universal method for engineers to make rapid estimates of "basic field water requirement" for new irrigation projects. This is defined as "the quantity of water regardless of source, required by a hypothetical crop in a full stage of growth in a soil which is being held at a moisture content well above the permanent wilting point."

The procedure was formulated to utilize climatic data available in countries where meteorological stations are of the "second order" (sic) class. The subject is presented primarily from an engineering point of view, i.e., as a guide to determining irrigation storage requirements and the capacity of distribution systems from available ordinary climatological data.

Olivier's formula has two terms: (1) Average depression of wet-bulb temperature in °C., and (2) a numerical factor based on "clear sky" values of solar radiation for various latitudes and months. The formula is very similar to the transpiration equation proposed by Briggs and Shantz in 1916, using the vertical component of solar radiation and the vapor saturation deficit.

Olivier wisely cautions engineers to be exceedingly careful in using water consumption data obtained from small container studies, be-

cause they may not have been adequately surrounded by a similar crop and therefore would receive excess radiation. He also recognizes that transpiration by crops grown in containers may be greater than by those in a field and that evaporation from pans and instruments is affected by their "exposure." The author supports his proposal to a large extent on results obtained in the classic work of Briggs and Shantz from 1912 to 1915 and on evaporation pan studies.

However, Briggs and Shantz also worked with containers 16 inches in diameter and 26 inches high, and each container was completely isolated and above ground. They measured daily transpiration rates as great as twice the direct radiation from the sun, even after correcting for the exposed area of foliage intercepting direct sunlight. They concluded that "Even on bright days, therefore, other sources of energy, such as the indirect radiation from the sky and the surrounding objects and heat energy received directly from the air, contribute materially to energy dissipated through transpiration." Thus, these studies are not typical of the environment of field crops.

Extensive literature review is presented. However, more recent and extensive U.S.A. literature on the subject was not covered.

Engineers, especially those work-

ing in countries where water-requirement data are meager, will find this book useful for rapid estimates of water requirements for projects having a variety of crops. For peak use rates for a period of a month on a single crop, with a complete green cover and for maintenance of adequate soil moisture, the forecasts obtained may be low for design purposes. The book is a good source of water delivery data for numerous scattered locations.

—MARVIN E. JENSEN

SCSA Meeting

The Soil Conservation Society of America holds its 18th annual meeting at Logan, Utah, August 25-28. The theme this year is "Land, Water, and People." Speakers include Gov. George D. Clyde of Utah; President Daryl Chase of Utah State University; Administrator D. A. Williams and Deputy Administrator Charles E. Kellogg of the Soil Conservation Service; and Society President George N. Browning. They and other speakers and symposia participants will discuss topics ranging from recreation to the human aspects of conservation planning and rural community development, and from urban conservation problems to conservation economics water and soil resource management.



